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The Principles and Practice of Filling Teeth with Porcelain.*

By DR. JOHN Q. BYRAM, Indianapolis, Ind.

Cavities on the Labial and Buccal Surfaces of Teeth.

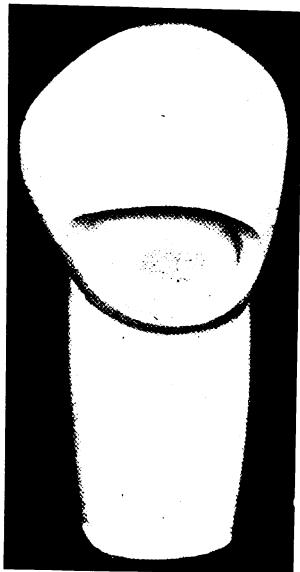
Forcing the Gum from the Cavity.

If the cavity extend beneath the gum margin, the gum should be forced from the cavity with base plate gutta percha. The gingival and approximal walls should be prepared with an inverted cone bur so that they form a slight undercut. The gutta percha should be packed in such manner that sufficient pressure to cause the gum to recede will be made upon it so that it will not interfere with the preparation of the gingival margin. In case it is inadvisable to form undercuts in any of the walls of the cavity, the gutta percha should be packed tightly into the cavity and secured with a silk ligature.

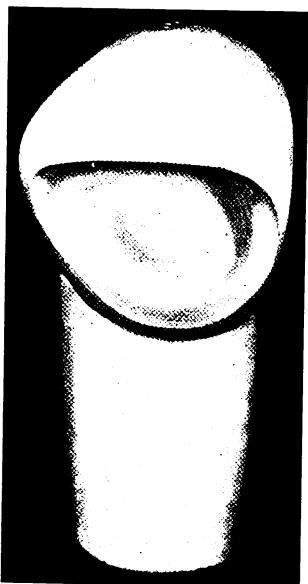
Marginal Outlines.

While cavities on the labial surfaces of many teeth are usually found in the gingival region, they occur also in the middle and incisal thirds of the labial surfaces of many teeth. Cavities on the labial and buccal surfaces of teeth usually assume some of the forms shown in Figs. 7 and 8. The circular form is usually found in the middle and incisal thirds of teeth. In the preparation of most cavities in the gingival region on these surfaces, the other forms of marginal outline should be used.

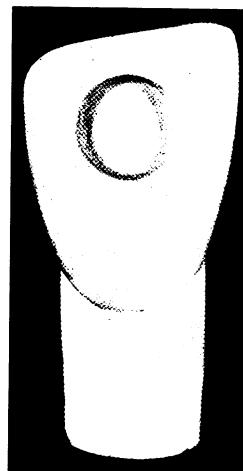
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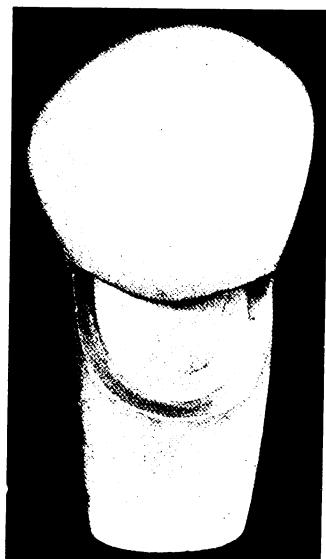
CUSPID.



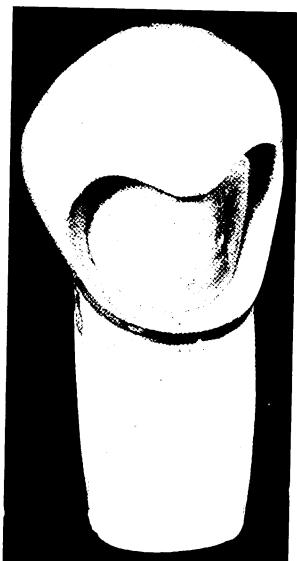
CUSPID.



INCISOR.



BICUSPID.



BICUSPID.

All frail enamel should be removed and the walls should run at right angles to the curves of the segments of the circles formed on the surfaces (Fig. 9, A and B). This permits the walls to converge slightly

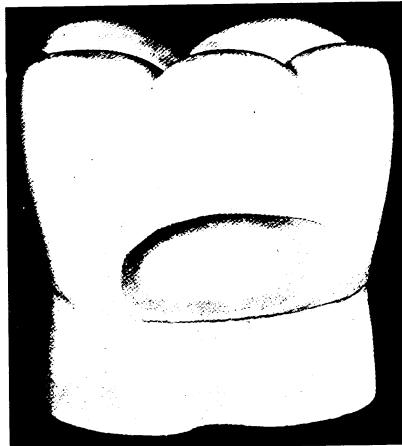


FIG. 8.

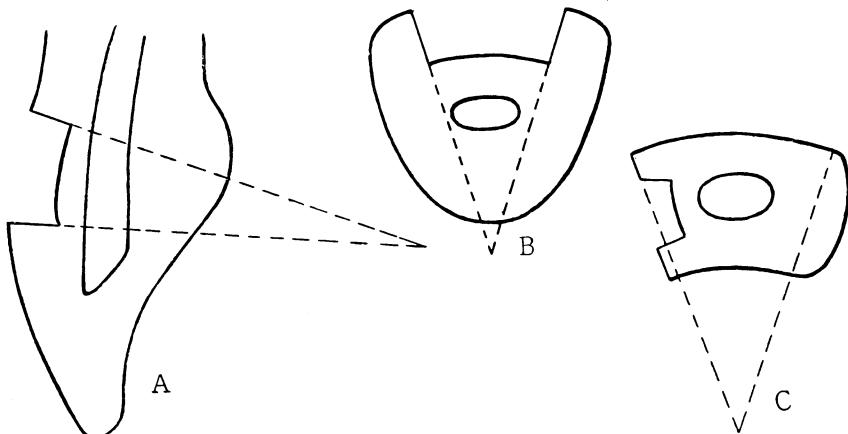


FIG. 9.

toward the pulpal wall (Figs. 10 and 11). This method of preparation gives a short bevel to the porcelain, which adds strength and causes it to be affected less by change of color along the margins after the inlay has been cemented into the cavity. These cavities should be as deep

ITEMS OF INTEREST

as the pulp will permit; for as the depth of the cavity is increased, its retentive resistance is also increased, and the change in color of the porcelain, after it is cemented in place, is decreased. The pulpal wall and the plane of the surface on which the cavity is located should be parallel (Figs. 10 and 11, A). This method of preparation does not encroach upon the pulp as readily as one that requires that the pulpal wall should be flat. In case the cavity is almost circular or elliptical in outline, a pit should be drilled at some point in the pulpal wall (Fig. 12).

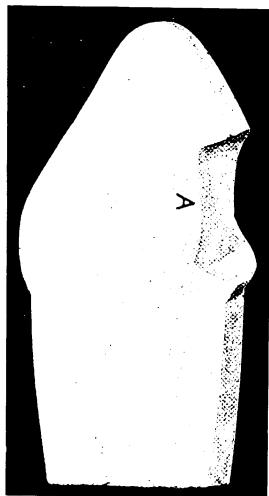


FIG. 10.

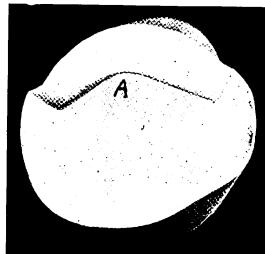


FIG. 11.

This insures a corresponding projection on the inlay, which assists the operator in setting it in proper relation to the cavity.

**Technique
of Cavity
Preparation.**

These cavities should be prepared by the use of fine-cut burs and stones. The best burs for the preparation of cavities on the labial and buccal surfaces are cylindrical in form (Fig. 4). The face of the bur should be at a right angle to its axis.

With burs of proper size the cavity is extended in all directions to obtain proper form and size, after which the margins should be polished with Arkansas stones.

Simple Approximal Cavities in Incisors and Cuspids.

It is essential that teeth be properly wedged before the preparation of simple approximal and approximo-incisal cavities for inlays, to insure proper withdrawal of matrices or impressions of the cavities, for the insertion of the inlay, and that the inlay may have the proper contour. The method of cavity preparation controls, in a measure, the extent of space that is required. It will be found that those cavities in which no



FIG. 12.



FIG. 13.

step is formed usually need more space than cavities with a step, for the withdrawal of matrices or impressions from such cavities.

Simple approximal cavities in incisors and cuspids may be divided into:

- (1) Cavities involving the approximal and labial surfaces (Fig. 13).
- (2) Cavities involving the approximal and lingual surfaces (Figs. 14 and 15).

(3) Cavities involving the approximal and both labial and lingual surfaces (Figs. 16, 17 and 18).

**Cavities Involving
Approximal and
Labial Surfaces.**

In cavities involving the approximal and labial surfaces the gingival wall should extend rootward far enough to reach sound dentine. It should form an obtuse angle with the lingual wall, and should unite with the labial enamel wall in the form of a

curve that should be concave mesio-distally. The labial enamel wall may extend farther laterally than the pulpal, and its margin should form a curve. The lingual wall should be a strong plate of enamel and should run at right angle to the pulpal wall (Fig. 13). The pulpal wall should extend from the gingival to the incisal wall in such relation that no undercuts will be formed. The incisal wall should form an obtuse angle with pulpal wall, and it should unite with the lingual wall so that the same kind of an angle will be formed. This permits the gingival and incisal walls to diverge slightly toward the labial surface.



FIG. 14.

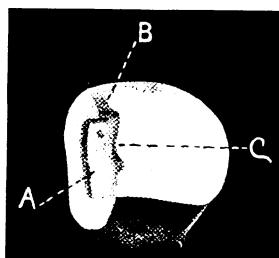


FIG. 16.

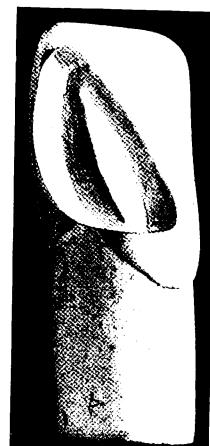


FIG. 15.

Cavities Involving Approximal and Lingual Surfaces.

In cavities involving the approximal and lingual surfaces, this method of cavity preparation should be used in those cases in which the labial wall of enamel is retained to support the incisal wall. In many cases the incisal wall of enamel can be retained with safety, where it receives the support of the labial plate of enamel. On the other hand, if the labial plate were involved it would also require the incisal angle to be involved.

The gingival wall should extend rootward far enough to insure a strong mass of porcelain on the lingual surface, and its margin should form a curve (Fig. 14). A groove may be formed, from one to three millimeters deep, which should unite with the labial and lingual walls in a curve so that no undercuts are formed with these walls, because such undercuts would interfere with the withdrawal of the matrix. The

lingual enamel wall should be in the form of a curve and should be so prepared that it will give the strongest possible support to the incisal wall. The pulpal wall should be formed in such manner that it will not interfere with the withdrawal of the matrix. The incisal wall should be a continuation of the lingual enamel wall. It should unite with the labial wall so as to form an obtuse angle.

A step may be cut on the lingual surface in the gingival and middle thirds (Fig. 15). This should extend laterally far enough to give the required retentive resistance to the inlay. The lingual enamel wall of the step should have a curved outline, and its pulpal wall should form a right angle with the pulpal wall of the cavity.

In cavities involving both labial and lingual surfaces, after frail walls of enamel have been removed and the margins have been extended to the desired outline, all decay should be removed and the cavity given such form as is required for the retention of the filling.

The gingival wall should extend rootward sufficiently to carry the margin of the inlay either to or beneath the gum margin. It should be at a right angle to the pulpal wall and should have a shallow groove running labio-lingually as far as it may be extended without interfering with the withdrawal of the matrix (Fig. 16 A).

The labial wall should extend gingivo-incisally in the form of a curve. It should be prepared so that its margin runs at a right angle to the segment formed by the curve of the labial surface. (Figs. 9 C and 16 B). It would also form an obtuse angle with the pulpal wall.

The lingual wall should be cut freely to avoid any frail enamel. It should extend from the gingival to the incisal wall in the form of a curve. The plane of the curve should be parallel to that of the labial wall (Fig. 18). Enough of this wall should be removed in the gingival third to insure a strong mass of porcelain in this region.

The incisal wall should form an obtuse angle with the pulpal wall. It should extend far enough from the incisal edge to provide a strong wall of enamel.

The pulpal wall should be convex labio-lingually through the gingival and middle thirds of the tooth (Fig. 16 C). It would join the labial, lingual and gingival walls in the form of a curve instead of sharp angles.

The cavity should be triangular in shape, with the base of the triangle toward the gingival wall, being formed between the labial and

lingual walls, which should be supported by dentine. It should be as deep as the pulp will permit. The final step in the preparation of the cavity should be the preparation of the margins. The enamel walls should be properly beveled and polished. Enough of the enamel should be removed in both the gingival and incisal thirds to prevent the formation of the frail margins of porcelain.



FIG. 17.



FIG. 18.

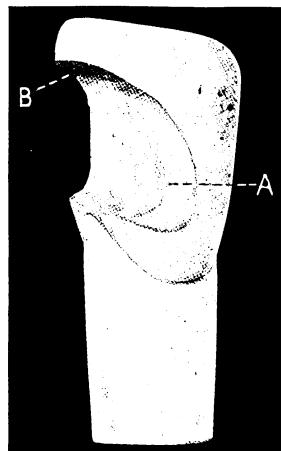


FIG. 19.

The Technique of Cavity Formation.

After the frail enamel has been broken down with excavators or chisels, a fine-cut fissure bur of suitable diameter is used to prepare the labial and lingual margins. After the preparation of the margins the triangular cavity is cut between the enamel walls with a hoe excavator, the blade of which runs at a right angle to the axis of the shank (Fig. 6 B). The blade should be short and sharpened on both sides and the edge. This permits the cutting of the dentine along the walls of the cavity. The incisal wall of the cavity should be prepared with a small bur of such shape that it will form an obtuse angle with the pulpal wall. The margins should be polished with plug-finishing burs or Arkansas stone.

Fig. 18 shows a form of cavity preparation similar to Fig. 17, except that it extends farther toward the incisal edge. This form of preparation should only be used in those cases where the tooth is slightly rotated in such direction that no stress will be applied to the incisal angle.

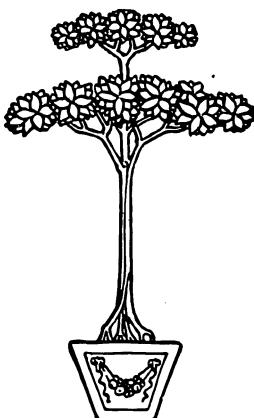
Simple Approximal Cavities with a Step.

Occasionally a step may be used in simple approximal cavities. The labial outline of the cavity should have the same form as that previously described. The gingival wall, however, should extend from the labial wall through to the lingual surface, and the pulpal wall should be prepared the same as in Fig. 15.

A step should be cut on the lingual surface extending through the gingival and middle thirds of the tooth (Fig. 19). The lateral extent of this step is determined by the degree of stress to which the tooth is subject. It should be as deep as the pulp will permit. The pulpal wall of the step should form a right angle with the pulpal wall of the cavity. Care should be exercised to prevent the step from extending too near the incisal edge.

Technique of Preparing the Step.

The enamel should be removed laterally from the gingival to the incisal wall with a dentate fissure bur and small stones in the right angle. After this has been done, a fissure bur with face at a right angle with its axis should be used to deepen the cavity. Enough of the gingival should be involved to prevent frail margins of porcelain in this region. The margins should be finished with properly shaped plug-finishing burs or Arkansas stones. A slight groove should extend along the angle of the pulpal and lateral wall of the step in the gingivo-incisal direction (Fig. 19 A). The cavity should be so prepared that the distance from the gingival to the incisal margin on the lingual surface is greater than this distance on the labial surface (Fig. 19 B).





Report of a Case of Small Spindle Cell Sarcoma of the Jaw.*

By WILLIAM T. S. DODDS, M.D.,

Professor of Bacteriology, Indiana Dental College; Lecturer on Clinical Pathology and Medicine, and Director of Clinical Pathological Laboratory, Indiana Medical College, Purdue School of Medicine.

Mrs. W—, aged twenty, of Indianapolis, presented herself at my office in August, 1906, complaining of a swelling and inflammation in the lower jaw on the left side. This swelling had existed for some six weeks, and had its origin, according to the patient, in the third molar, which could not erupt because of insufficient room in the angle of the jaw according to her dentist.

The family history of the patient was bad, her father and mother both being confirmed alcoholics, and probably other dissipations and depravities existing which may have had some influence upon the physical condition of the patient. This history was obtained in an indefinite way, because the girl had been separated from her parents early in childhood by the humane society and placed in the home for girls.

Personal History. The patient had not been ill, and was in a strong, robust physical condition, with every appearance of perfect health. She had no blemishes nor marks of hereditary disease evident upon her at any time. She had had the usual diseases of childhood from which she had made good recoveries.

The Present Illness. The present illness began early in July, 1906, with a slight swelling at the angle of the jaw, accompanied by an attempt of the third molar to appear. This persisted for some two or three weeks, when she consulted with a dentist, who advised her that the space between the second molar and the angle of the jaw was insufficient to permit the eruption of the third molar. He advised her to have the second molar removed, which would then give space for the eruption of the third molar. This was done, without any relief of the swelling or disturbance of the local area. Soon after the withdrawal of the second molar she consulted me, and I sent her to another dentist, because the conditions present seemed to be purely in the field of dentistry. This dentist, upon examination, found that the alveolar process surrounding the third molar was necrosed and granulating tissue and pus formation evidently had dis-

* This case was reported in January, 1907 before the Indianapolis Medical Society, by the author.

 EXCLUSIVE CONTRIBUTIONS 

lodged the third molar from its process. This tooth was found floating in the loose tissue surrounding the angle of the jaw. In addition to this, he observed that the remaining molars and bicuspids were diseased in practically the same manner as the third molar. After consultation he removed these in the hope of effecting a cure.

At this time the upper third molar and second molar began to ex-

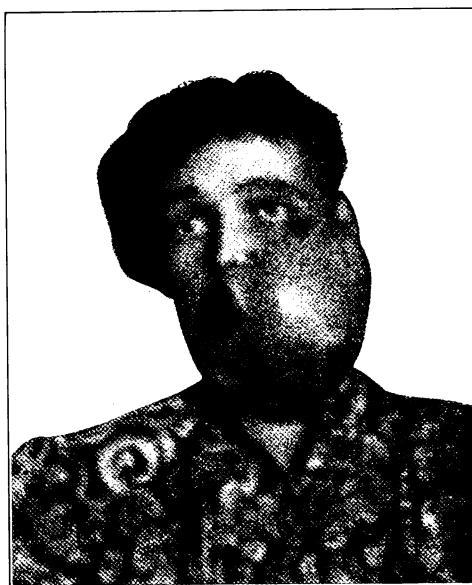


FIG. I.

PHOTOGRAPH OF THE CASE TAKEN 12 HOURS BEFORE DEATH.

The light spot showing in the center of the mouth is not the tongue. It is a portion of the tumor, which has filled the mouth and crowded the tongue backward into the throat.

hibit the same symptoms as those noted in the lower jaw, and these teeth were subsequently removed, which presented the real pathological conditions. During this time, which covered a period of two or three weeks, the tumor at the angle of the jaw continued to grow with a certain amount of infiltration of the cheek, tonsilar and peritonsilar areas, and the muscular fibrous tissue at the base of the tongue. The tumor had ceased to be painful after the removal of the lower third molar, and now interfered with the patient only in the operation of mastication.

At this time the tumor had progressed to such a size that the encroachment upon the tongue and the protrusion between the jaws into



the mouth had caused some considerable annoyance, and it was decided to remove some portions of these and establish drainage, because considerable pus and sloughing had taken place. The odor from the secretion was excessively foul, and the discharges were of a prune juice character. Persistent, effectual antiseptic douching of the mouth with proper medication failed to retard or relieve the condition, and a surgical operation was deemed advisable.

Dr. E. D. Clark was called in consultation, and
Surgical Treatment. we opened what we supposed to be an extensive abscess along the angle and lower quarter of the left jaw. This was without avail, because, in the place

of an extensive abscess formation we found only succulent tissue very extensively supplied with blood vessels. No abscess; no pus could be found anywhere along the angle of the jaw, and the only result obtained at this time was temporary relief from pressure. In two or three days we sent the patient to St. Vincent's Hospital, where an operation was performed which included currettment of the antrum of Highmore of the cheek and lower jaw, peritonsilar tissue and tongue. At this time sections of the tissue were obtained and microscopically examined, demonstrating the presence of a malignant growth. The first tissue obtained was more particularly that of a necrotic character, without any general cellular structure, and we concluded that we had to deal with a cancrum orum, and so informed our patient. This currettment resulted in a great amelioration of the patient's symptoms, and conditions approached those of normal with regard to temperature, pulse and general expression of the symptoms. We expected to see conditions greatly improved and our patient get well. This, however, was soon found impossible because of the rapid recurrence of the growth along the entire line of operative procedure, with apparently more violence and rapidity than before. Another thing became apparent with the recurrence of this growth, and that was a change in the appearance of the tumor formation. Heretofore the mass was made up of a soft, succulent material resembling an abscess, but this time the tissue was firm, hard and indurated.

Sections of this recurrent mass were obtained and microscopical examinations proved them to be composed of a small spindle cell sarcoma which was greatly infected.

At this time a great abscess developed between the cheek proper and this tumor which endangered the life of the patient from sepsis. Evacuation of the abscess was followed by a prompt improvement in the patient's condition. After this, no sepsis appeared, and no great quantity of pus was evident during the remaining time.

**Pathology of
Mouth Tumors.**

A few words with regard to the pathology of this tumor formation upon the jaw, the result of irritation of diseased teeth, or constantly irritating substance in the alveolar process. Early pathologists classified this epulis as *recurrent fibromata* without any particular reference to malignancy. Pathologists recognize, at the present time, that these epulæ are of benign and malignant nature. The malignant epulæ should be classed with the sarcomata and not in a distinct classification by themselves.

This tumor presented the characteristic grayish white fibrilated surface when examined in section, which is characteristic of the sarcoma. The malignant epulæ are more vascular and more succulent than are sarcoma. These large, irregular shaped cells which make up the tumor formation in epulis are probably the cells which compose the capillaries and blood vessels proliferating this fibrous structure. The tissue in epulis is not so distinctly embryonic as that of sarcoma. A glance at the sections which accompany this report will immediately classify this tumor as a spindle cell sarcoma. More questions might be raised with regard to the number of round cells, and an objection as to the clear classification with the spindle cell varieties. It is difficult to say whether or not these are round cells or only cross sections of the spindle cells which would give the appearance of a mixed cell sarcoma. Indeed, the classification with regard to the shape of the cells is more or less arbitrary and not much importance is attached thereto.

**Early Diagnosis
Important.** This case proves the observation, which is frequently noted, that dentists, as a rule, do not appreciate the different varieties of tumor formations in

the mouth from the gross appearance of the tumor in its incipiency. It is of great importance, in this class of tumors particularly, that the differentiation should be made early in the disease. Of course, numerous cases are seen by dentists of certain peculiar tumor formations in the mouth which are the result purely of inflammation, and rapidly succumb to the ordinary dental manipulations. This may be one reason for the apparent ignorance with regard to the gross appearance of tumors situated in the mouth.

A malignant tumor in its incipiency is practically always devoid of inflammation and of inflammatory products. An ordinary tumor, the result of an abscess at the root of the tooth, or the result of some infection of the teeth, is always accompanied by pain, swelling and inflammation. This, of course, differentiates grossly a benign from a malignant tumor. However, there are certain benign tumors which appear in the mouth that never assume a malignant state, and could not be differ-



entiated by this method, but such tumors do not grow rapidly and do not encroach upon, nor grow into other tissue than that from which they spring.

A tumor situated in the mouth, or more particularly in the gum, alveolar process, or jaw bones, which is not painful, is not accompanied by inflammation, and which grows rapidly, should be observed with the utmost suspicion because such tumors are, as a rule, malignant. The

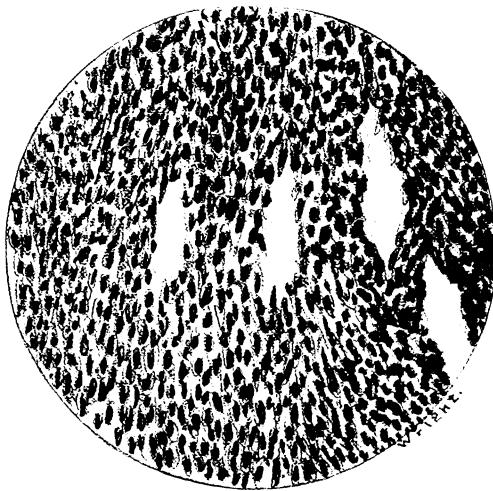


FIG. 2.

²⁵ objective showing richness of cells and small amount of connective tissue.

irritation which may accompany the eruption of a tooth, causes a swelling and inflammation which is uniform and regular, while the swelling of tumor formation, the result of a malignant growth, is, as a rule, not so regular and uniform, but appears nodular and infiltrating.

Another gross appearance with regard to tumor formations, due to sepsis, is that almost immediately upon the development of such a tumor formation, we have a secondary inflammation of the submaxillary glands, and the glandular structure around the base of the tongue, and down the cervical lymphatics. In the sarcomas we do not have such glandular inflammation early, and when this inflammation takes place it is a long time after the real nature of the process becomes apparent to the casual observer. To be sure, it often requires a microscopic examination of the tissue to demonstrate its true nature, but this should not be withheld

EXCLUSIVE CONTRIBUTIONS

until the patient's life is in danger by the rapid encroachment of the malignant growth upon the surrounding organs.

The prevalence with which sarcoma springs from the periosteum of the alveolar process and the surrounding connective tissue should stimulate the dentist to be extremely suspicious of any tumors discovered in the mouth, where pus can not be accurately and absolutely demonstrated. Especially should their suspicions be aroused if the tumor manifests in this area without pain, without inflammation, and particularly without fever; because no tumor formation, the result of sepsis, will exist long

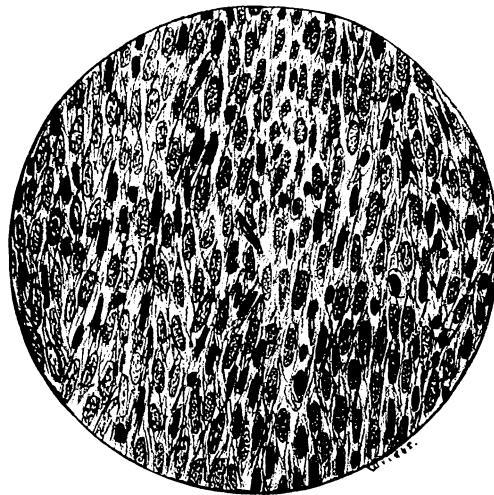


FIG. 3.
½ objective. Same as Fig. 2.

in the mouth without some manifestation, as above described. The duty of the dentist, in such cases as this, is to obtain sections of the tissue for microscopical diagnosis and demonstrate beyond any reasonable doubt the existence of the condition before any chances are taken with the patient.

The girl's life might have been saved had the tumor been recognized as a malignant growth early in July, and not have been permitted to develop into such a horrible, disfiguring, mutilating, fatal affair.

The photograph which accompanies this article was taken twelve hours before the patient died from hemorrhage, hemorrhage being due



ITEMS OF INTEREST

to a sloughing of the tumor in the region of the carotid arteries. In conclusion, I would call your attention to three points in differential diagnosis.

First. That any tumor which presents itself in the mouth, of rapid growth, being devoid of inflammation, pain and pus, should be immediately examined under the microscope to determine its nature.

Second. If the tumor is demonstrated to be malignant, it should be removed by radical surgical operation, thereby curing the patient and saving discredit upon the dental and medical profession.

Third. That sarcoma and epulæ should be classified under the same category of tumor formations, as a rule.





American Society of Orthodontists.

Discussion of Dr. Reoch's Paper.

Dr. Stanley. Dr. Reoch has said that it often happens that scientific minds, working independently of each other,

may simultaneously startle the world with some great discovery. Indeed, this so often happens that the man is exceptional who can lay sole claim to any great thought or invention. The spirit of discovery is inherent in man's nature. It goes hand in hand with progress, and as man's needs increase it keeps pace. What wonder is it then that two men, with a common interest in solving complicated problems, should arrive at the same conclusions, at about the same time, and without any previous exchange of ideas.

There is a time and a place for "priority." By that I mean that in the discussion of scientific facts, before a scientific body, the tendency is too often to center the discussion upon the question of who is entitled to first mention in the discovery of a great truth, while the application of that truth, and its result upon those benefited by it is overshadowed, or entirely lost.

Dr. Reoch has alluded, fittingly and becomingly, to the origin of the intermaxillary force in the opening of his essay, and then followed with examples of the application of this indispensable force in the treatment of malocclusion. He has with truth said that this great discovery is burying the "extractionists" deep under the sod. The few remaining believers in mutilated dentures as a cure for certain existing evils are dying hard. But I believe even these few now show signs of weakening.



Dr. Reoch is most generous to this handful of exponents of false doctrine. He grants that extraction may sometimes be necessary, yet he states that he has not found it necessary in his experience, nor have I in mine; and I venture to say that the majority of those present—yes, I dare say all—will echo his words.

Intermaxillary force, in its usual form of application, is the key-stone of the arch of modern orthodontia. Without it the whole structure would fall.

We may differ in our conception of perfect balance, or harmony of facial lines, but the differences lend no excuse for the extraction of teeth in the treatment of malocclusion. The *intelligent* use of the intermaxillary force can only produce the *best* result in any given case, while so-called "judicious" extraction has but one result—creating one deformity to balance another.

Dr. Reoch has shown a number of uses to which the simple elastic can be put. Practical cases teach us more than volumes of theory. We have received a number of sound practical suggestions which can not fail to be of use to us.

Undoubtedly more can be accomplished with this form of intermaxillary force (the elastic band) than any of the others mentioned. The inclined plane as used by Dr. Ainsworth has its place, though necessarily it can not supplant the elastic band stretched from one arch to the other.

I would like to discuss certain features of each case shown on the screen, but I fear it would consume too much time. One point, however, which one of the slides brought to my mind is of special interest. Dr. Reoch showed his method of quickly aligning buccally displaced molars. It seems to me that the application of the elastics from molar to molar as he described would be of great assistance to us in those cases where the lower molars are unduly inclined lingually, where it seems almost impossible to move them. I think we could apply the elastics as an auxillary to the expansion arch. The tendency would be to draw the upper molars lingually. This can be overcome by re-enforcing the upper molar anchor teeth in any way that is practical.

In correcting mesio-distal malocclusion I think we get a better result in the end by the gradual application of the elastic force. In retention I find the light elastic very satisfactory when worn at night, after the mesio-distal relation has been corrected, and if there is any tendency for the teeth to slip, have them worn through the day as well.

The case Dr. Reoch showed of a young lady, where the chin had gone to the left, I happened to see last spring as she hurriedly passed through New York. She came in for a few minutes. The inclination

of the chin is almost absent now. The case was so very much improved that I felt highly gratified at Dr. Roech's result.

Mr. President, I thank you for inviting me to

Dr. Henry A. Baker. discuss this paper. I also wish to thank Dr. Reoch for the compliments which he paid me in relation to the intermaxillary elastics. I do not know that I can say anything in regard to their merits that you do not already know; however, it may be interesting to you to know the history of their introduction.

Soon after the birth of my youngest son, his mother was taken very ill. As a result we were obliged to feed him by means of a nursing bottle. As time went on to our surprise and horror we found the pressure of the rubber nipple, slight as it was, had created a decided deformity in his delicate jaws, and when his permanent teeth erupted the result was a very aggravated case of what Angle classifies as distal occlusion.

I prepared models and studied the case carefully. My conclusions were that if I reduced his protruding upper teeth the lower jaw would still occlude distally, and to get normal occlusion it would be necessary to bring the lower jaw forward. Then the question arose as to how this could be accomplished. The intermaxillary elastic was the result. I decided that the best time to commence operation would be just before the eruption of the lower twelfth year molars, so that after they erupted they would assist in holding the remainder of the lower teeth in their new position. After laying out my line of treatment and deciding the best time to accomplish the same, I exhibited my models before the "American Academy of Dental Science" and outlined my proposed treatment.

This case was corrected in two months' time, and no other force was used than the intermaxillary elastics; that is to say, the teeth were brought into normal relations and allowed to settle into better occlusion before putting on retainers.

The probable cause of this rapid change was the use of much heavier elastics than we use to-day. I used them double, hooking them over the tubes of the lower anchor bands, in the same manner as is used to-day, then stretching them forward and tying them to the upper arch wire just in front of the upper cuspids with silk ligatures. It being my son's case, unfortunately I made no record in my book, but as I have said before, I commenced operations before the eruption of the lower twelfth year molars, and my son will be twenty-six years old his next birthday, which to my mind is an authentic record. Many years after the correction of this case Dr. Case wrote to me claiming priority of intermaxillary elastics. He also sent me publications wherever he had men-



tioned them, and his records would indicate that he made no great account of them except as an auxillary force to other methods. I do not care to go into a deep discussion on this point, as the profession knows very well my connection with intermaxillary elastics and what they will accomplish. I have received some very kind letters from Dr. Angle and others in the profession who have used them successfully in a great many cases, and I would also say that Dr. Angle has added greatly to their efficiency by attaching a hook to the upper arched wire, which enables the patient to apply them without the aid of the operator, and I give him great credit for the improvement. There is one more thing I wish to mention in regard to Dr. Reoch's paper, that is in relation to the last illustration that he exhibited, showing a case of prognathism. Some three or four years ago I advanced the theory that this was caused by habit, especially where there was a loss of several teeth in the molar region. My idea is that, being unable to masticate in the back part of the mouth, patients are obliged to use their front teeth, and as a result get into the habit of reaching forward, their lower front teeth tipping back to a marked degree. Everything that I have been able to learn corroborates my theory, and I ask you, gentlemen, to bear this in mind and get as much of a history of similar cases as possible. If we can establish the fact beyond a question it will be still another factor as an argument against promiscuous extraction.

Just one word. I have an idea which I have

Dr. Hawley. not fully tried, but which I believe to be a good one.

We all know, who have treated cases of the First Division of Class II, that there is a large overbite which is difficult to take care of. Dr. Reoch has thrown on the screen an illustration of the application of the intermaxillary bands, in an attempt to correct that overbite. I saw during the last summer the same plan worked out very beautifully, but undertaken in the beginning of the operation. Dr. McBride, of Dresden, in treating these cases, instead of putting the intermaxillary ligatures from the sheath hook back to the molar band, uses two, one going over the upper molar tube.

While I was visiting him this summer we improved that by putting a little spur on the mesial end of the tube on the upper molar band so as to carry the pull a little further forward. In this commencement of the forward movement of the lower jaw he starts to correct the overbite. That has been a valuable suggestion to me, and I look forward to a little quicker and a little better result in these cases in the future. That pull of the ligatures will also correct, or prevent, the outward tipping of the cusps of the superior molars. Instead of waiting until the closing of the case they should be started at practically the beginning of the work.

ORTHODONTIA

Dr. Reoch has given us an excellent paper, and
Dr. Casto. I wish to thank him personally for it; also to express my appreciation for the great amount of work he has done in its preparation.

The essayist referred to some cases of Class II that I have been treating by using the intermaxillary rubbers on individual teeth in connection with an inclined plane. I do this for the purpose of shifting the occlusion, lengthening the bite and depressing the lower incisors. I have employed this method successfully in those cases of Class II where the lower incisors strike against the soft tissues lingually to the upper incisors, and where it is necessary to lengthen the bite, after shifting the occlusion so as to prevent the lower incisors from occluding too heavily upon the upper incisors.

Dr. Reoch, in describing the method, spoke only of using a bite-plate with an inclined plane on it and wires bent over the incisal edges of the upper centrals. This form of plate is a modification of the old Kingsley bite-plate, and was first used, I believe, by Dr. Angle. The wires passing over the edges of the incisors serve the double purpose of preventing the labial movement of the incisors and to prevent the plate from being forced into the soft tissues. The intermaxillary rubbers on the individual teeth may be used for the same purpose in connection with any form of an inclined plane. It makes no difference whether it be a plate or an incline after the fashion of the Davenport or Ainsworth pattern. The essential thing is to keep the force of occlusion upon the teeth to be depressed, and freeing those teeth to be elongated.

In cases where it is desired to increase the depressing force upon the lower incisors, and the elevating force upon the bicuspids, I have used in connection the method suggested by Dr. Case, namely: Bands are placed on the incisors with lugs pointing incisally. The lugs or hooks in the bicuspid bands which point lingually are made larger so as to engage the wire spring and allow also of rubbers being placed on them. Bands are placed either on the first or second molars, as the case may require, with hooks pointing occlusally; a spring wire is then fitted around the arch, being adjusted so as to engage over the hooks on the molars, under the hooks on the bicuspids, and over the hooks on the incisors.

Dr. Hawley spoke of using the elastics on individual teeth at the beginning of a case, for the purpose of elongating the molars, and at the same time shifting the occlusion. That may be done provided there is a harmony in the size of the arches when the lower is set forward. But where there is practically no harmony in size or occlusion with the upper arch, some previous treatment is required. This must be done to estab-



lish a proper aid to accommodate the occlusion when shifted. The elastics may be used on individual teeth for retention for a limited time in ordinary cases of Class II. In such retention, they may be used either with or without an inclined plane. They may also be used advantageously in any case where it is desired to draw the teeth into an interdigitation.

Sometimes after the occlusion has been shifted a space remains between the upper cuspids and bicuspids; or the cuspids may not be fully erupted and located slightly mesially to normal. In such cases the elastic may be used to a decided advantage. This is done by placing bands on the cuspids and lower first bicuspids and then engaging the elastics over the hooks on the cuspids and under the hooks on the bicuspids, or the elastics may be extended from the cuspids to the lower first molars, depending upon the requirements of the case. There are many other conditions where the intermaxillary force can be used to advantage.

Yesterday, Dr. Rogers made some reference to the use of an inclined plane, made by adding another cusp on the lower first bicuspid.

I wish to say that at the Chicago meeting, more than a year ago, Dr. Robert Dunn, of San Francisco, gave a clinic on that very thing. I have used it effectively. I have also put an inclined plane on the lower second bicuspid, allowing the incline to strike mesially to the lingual cusp of the upper second bicuspid.

The inclined planes used on individual teeth in connection with the intermaxillary elastics are valuable in retention, where it is necessary to change the position of the teeth slightly in a mesial or distal direction.

So far as I know, the credit for the addition of a cusp is due to Dr. Lourie. I think he showed it at the Philadelphia meeting of the American Society of Orthodontists. It is not a little amusing to me to notice these Angle students taking up some of these appliances and things which have been relegated to the past, such as "inclined planes," "special appliances," etc. It is a pretty good sign, and means that broader thought prevails.

I put a big question mark after the statement that the intermaxillary rubber ligatures are effective for retention. What are you doing while holding those rubbers on the teeth? You certainly will not expect a stationary retention or even rest. It is a serious question, and that kind of anchorage is a confession of a failure in retention and regulation.

Another point. Dr. Casto has spoken well with reference to harmonizing of the arches before swinging the mandible forward. I have had some success with inclined planes soldered to the lingual of a Case retainer. They should be used after the teeth are put in harmonious

ORTHODONTIA

relations in each jaw, and then they will aid in producing the proper relation of the jaws. In many of these cases of distal occlusion we will not succeed in retention.

I noticed in one of Dr. Reoch's illustrations a *space distal to the cupid tooth*. That is a *diagnostic sign* that the upper *molars* and *bicuspid*s have been *moved too far distally*. In most of those cases the lower jaw is too far back, and in trying to compromise you will move the side teeth too far and cause this space and fail in trying to force the *incisors* and *cuspids* back. I believe the intermaxillary force should be an auxillary force only.

In showing the slides I forgot one. It shows
Dr. Reoch. a method of applying intermaxillary force that Dr.

Rogers has used to advantage. A hook is soft soldered to the end of the upper or lower arch, as the case requires, and so arranged that all the pull of the rubber ligature is transmitted by this hook to the arch, in this way forcing the teeth ligated to the arch mesial to the anchor tooth, in a mesial direction, without a stress upon the primary anchor tooth. It is a method that can be employed to great advantage in certain types of cases.

I wish to thank you for your kind attention and consideration of this paper.

An Appliance for Expanding the Dental Arches, Thereby Increasing the Size of the Nasal Passages and Superjacent Bones.

Dr. E. A. BOGUE, New York.

Read before the American Society of Orthodontists.

I wish to express my regrets now that this Society of Orthodontists was not formed when I was a child, because my incisor teeth shut end to end, and I can not therefore enunciate certain words correctly.

I started last July to write a paper controversial to my friend Dr. Angle, hoping he would be here. When I found he would not be here I hitched it on to a few disjointed items, which I hope you will excuse in lieu of a paper.

In the ITEMS OF INTEREST for June, 1906, I read in a recent paper of Dr. Angle's that "the deciduous teeth almost always erupt into ideal normal occlusion, and the child denture is not only perfect in form in part



ITEMS OF INTEREST

and in whole, but in location with the rest of the face and head, so that there is beauty, harmony and the highest efficiency . . . so, when the first molars erupt they do so under the most favorable conditions, unhampered by predecessors or by those teeth anterior or posterior to them, the jaws having been lengthening for years for their coming, and instead of being in any way hindered in their eruption they are, on the contrary, *guided into* and *guarded in* normal positions by the beautiful normally built child denture anterior to them."

Dr. William J. Brady, of Iowa City, in discussing Dr. Angle's paper says: "The action of heredity is the chief, if not the only controlling force that settles the position of the teeth named, and they are so placed that when they erupt they have only to emerge through the tissues covering them when they are in their correct places. This is why the temporary teeth are always practically regular, which fact is one of the best established in relation to teeth."

Dr. Fletcher, of Cincinnati (quoting Talbot on irregularities of the teeth), says: "The deformity always commences at the sixth year and is complete at the twelfth."

Either I have misunderstood or all these gentlemen are mistaken. I present for your consideration a number of cases of deciduous teeth taken from among my own models, the cases occurring in my own practice or in that of my son, all showing distinct irregularities in the positions of the temporary teeth, and several of them showing such extensive irregularities that if the contention of Dr. Angle is correct, and I believe it is, that the first permanent molars are guided into their places by the child denture anterior to them, then the first molars can not possibly be in normal position.

If the first molars were guided into correct articulation there would be no cases in adolescent life of dislocation or malposition, either unilateral or bilateral, to call for the reciprocal force, which has proven so efficient in correcting these oftentimes perplexing and troublesome irregularities. Irregularities arise very early in life, according to Dr. Fletcher's own suggestion; their cause may be antenatal, and certainly are if heredity plays the part that Mr. Burbank teaches us, and that Darwin originally propounded.

But I think that influences that come into operation *after* birth, and which we can understand much better than we understand heredity, are mainly responsible for determining the position of the teeth.

Close observation of minor deficiencies readily show that irregularities may be found among the temporary teeth about as often as among the permanent ones.

**Irregularity
Prognosticated by
Temporary Teeth.**

My own experience is that all serious irregularities of the permanent teeth are indicated by the positions of the deciduous teeth, and that at five years of age or earlier, one may detect these irregularities, and, in many instances, avert them by prompt action in encouraging normal development by the removal of some obstruction which nature, unaided, is not able to overcome.

I present to you the case of a little girl eight years old. I found both arches a little too narrow, according to the Hawley measurements. The lower incisors were posterior to normal. The right lateral was $3\frac{1}{16}$ of an inch posterior to the other three. Upon rearranging the teeth on a plaster model I found the central incisors needed to be advanced about an eighth of an inch; consequently, in order to make a perfect arch with the cuspids the whole lower dental arch needed to be broadened about $3\frac{1}{16}$ of an inch and the four lower incisors made into a perfect arch on those lines. I placed bands with vertical tubes around the second lower temporary molars, and an expansion arch engaging those tubes was placed on the buccal side of the dental arch. By utilizing the temporary teeth for purposes of regulation all injuries to the permanent teeth from fixtures are avoided. On the lingual side of these bands a wire soldered to each band acted upon the four adjoining teeth, drawing them simultaneously outward as the external wire arch expands. On the lingual side of the left lower molar band was also soldered a gold and platinum spring wire, which, having been bent to the form of the perfect arch, engages beneath a little spud attached to a band on the right lateral incisor, and will eventually, if kept in position, advance the right lateral incisor to its proper place in the arch as well as all the other three incisors, so soon as the arch shall have been broadened enough to receive them.

On the upper teeth bands were similarly placed upon the second temporary molars with lingual wires touching four teeth on each side, the same as below. Outside the dental arch was a wire expansion arch engaging in horizontal tubes attached by swivels to the upper molar bands. This arch has a thread cut on each of the ends for two nuts, the forward one designed to compress spiral springs surrounding the arch wire just forward of the horizontal tubes. The posterior nuts are designed to prevent the arch wire from drawing the incisors too far forward, and are also designed to prevent losing the fixture off. The two upper central incisors are surrounded by bands having a little spud on the lingual side to engage small ligature wires that bind the incisors to the arch wire. The resiliency of the spiral springs will carry these teeth forward until the movement is stopped by the posterior nuts. At the same time the wire expansion arch will draw the four molars on each

ITEMS OF INTEREST



FIGS. 1, 3 AND 5.

FIG. 2, 4 AND 6.

side outward to correspond with the outward movement taking place with the lower teeth, and as these temporary molars move laterally outward they carry with them the crowns of the permanent bicuspids that are embraced by the roots of these temporary molars, thus broadening the entire upper arch. The plaster models of the case, taken after the fixtures were in place, explain perfectly the position of the fixtures, which should be maintained until the teeth are in position.

It will be noticed that the lower incisors and the upper central in that mouth, Fig. 1, and the entire upper arch, are much smaller than this other one, Fig. 2; the one is four years of age and the other five.

Fig. 4 is the same case—five years of age. The irregularity is readily seen. The lower molars are entirely outside the upper arch. The upper central incisor of Fig. 3, is within the lower arch. Adenoids were developed in Fig. 4 at six weeks of age. The mother found at that time that the child was sleeping with the mouth open, and on examination adenoids were found.

Fig. 5. This case was left open in order that the irregularities of the temporary teeth might be seen. Patient was four years of age. The other, Fig. 6, is five years of age, and bites end to end.

Fig. 7 was five or six years of age, and the entire lower arch closed outside the upper. The difference in size between the upper and lower you will note in the next.

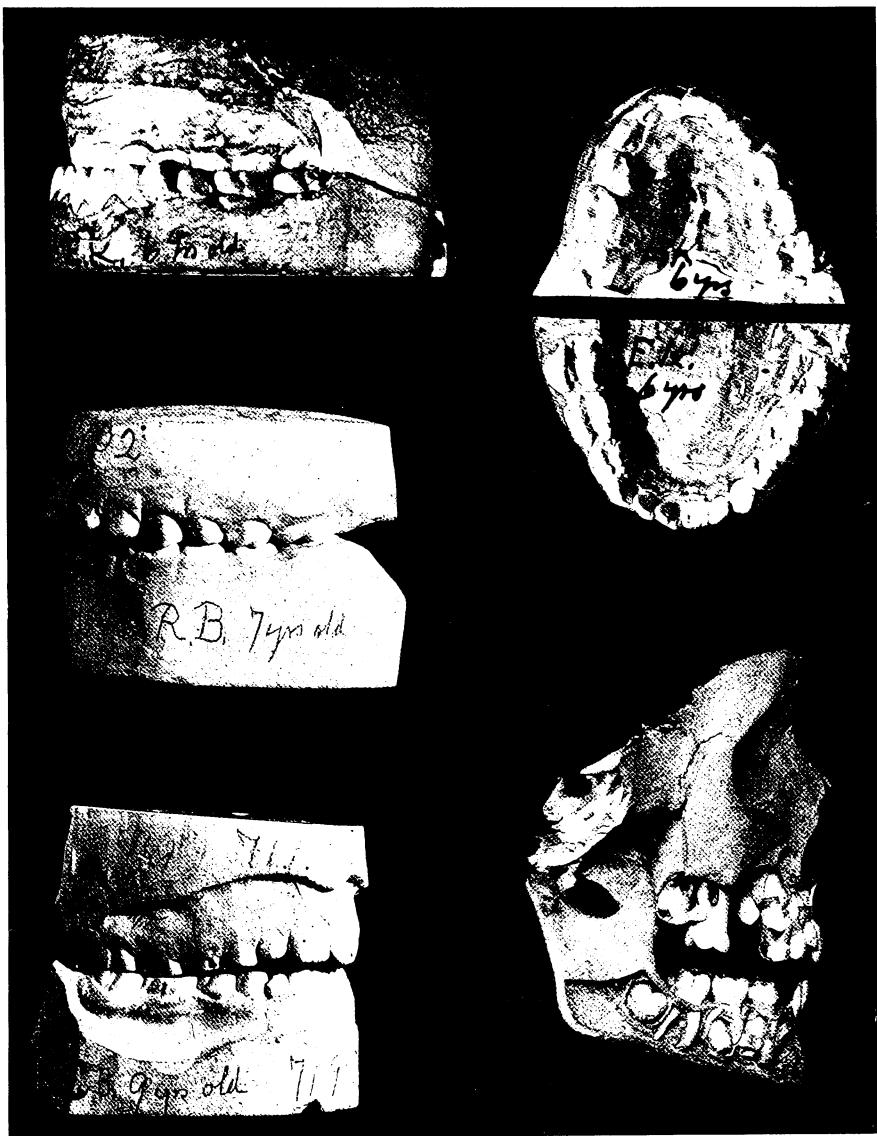
Fig. 8 is the same case. The difficulties of correcting that particular case was augmented by the fact that the child lived in Paris.

Fig. 9 is seven years of age, and the adjoining one, Fig. 10, nine years old. Fig. 9 is the case I spoke of yesterday, where the model at seven was carefully measured—again at eight and ten, and our respected president, in measuring the last two, did not find any difference, although two years had elapsed.

Fig. 11 is an interloper, put in to show how the loss of a temporary tooth and the occurrence of a cavity of decay will cause the permanent tooth to bodily come forward, apices of roots and all. So there the principal molar actually occupies another position from the correct one, even though the anterior temporary teeth were in place. It is the most vivid instance of how the loss of a temporary tooth can result in the serious irregularity of the permanent teeth that I have come across in my researches.

Fig. 12 is the case I have been describing. The lower model was cut in two in the middle and broadened. The bands were placed upon the second temporary molars as described. The wires, both above and below, engaged with four teeth on each side, and the arch outside was

ITEMS OF INTEREST



FIGS. 7, 9 AND IO.

FIGS 8 AND II.



FIGS 12, 13 AND 14.



ITEMS OF INTEREST

set to do the work which I have described. On the lingual side of these bands the wire acts on four teeth.

Fig. 13 is the lower arch. The right lateral incisor was away in, and back of it is the gold and platinum wire, which, when inserted runs away back to the left molar, but when it shall have done its work, that right end will come exactly to the point between the right lateral

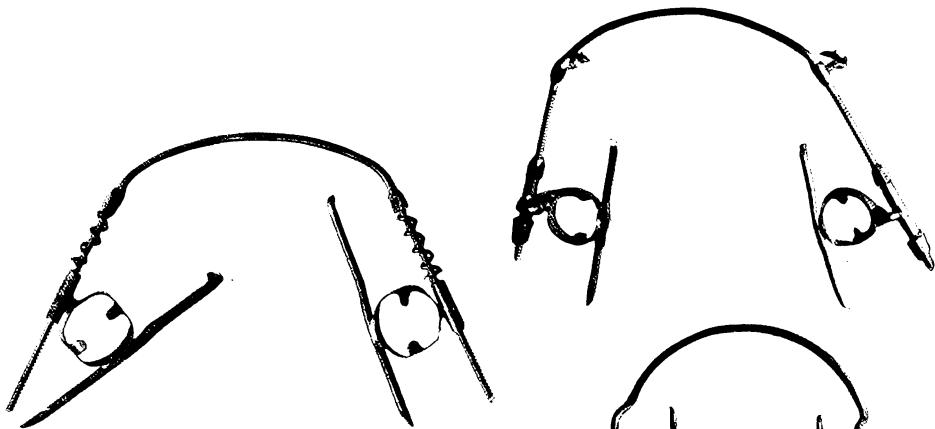


FIG. 15.

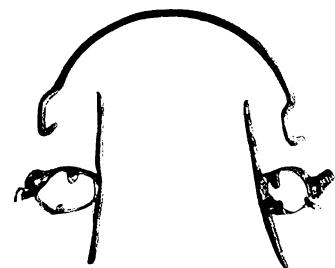


FIG. 16.

and cupid when the teeth are all regular. Those fixtures were put in on the sixth day of July last. I have not yet seen the patient, but am hearing good reports from the parents. I wrote Dr. Angle and requested the name of a good orthodontist in the neighborhood. I sent the name of that orthodontist and received models.

Fig. 14 is the model as sent me. The upper arch has spread not quite a quarter of an inch, and I hope Dr. Hawley will give his views as to how nearly it corresponds with that arch of his. The lower arch has correspondingly expanded and the incisors have been pushed forward to the point you see, but the end of the gold and platinum finger spring wire was crowded down below the spurs on the incisor bands so the ends stuck out against the gums, and therefore the end of my finger wire was cut off, much to my regret. I was keeping this case for this

meeting, and I earnestly wanted to show it complete, showing what could be done by an apparatus designed on the model, where the regulation was done on the model, without ever touching it again. The arch wire, the Ainsworth wire, was taken off to be broadened about one-eighth inch in order to accomplish something that I desired. It was accidentally broken. The orthodontist did not telegraph me or I would have sent a duplicate. The bands on either side were taken off and an Angle fixture inserted. The parents wrote to know what to do. I said let it alone, I am familiar with the Angle fixture. It does good work, only it requires constant attention, whereas the fixtures I put in July 6th worked on until November 8th without any further attention.

Figs. 15 and 16 are the fixtures illustrated. Notice the drop hook, etc. Those hooks can be turned up when the child is eating, under the cheeks; then the child can turn them down again and hitch on the rubber.

Discussion of Dr. Bogue's Paper.

While I believe that Dr. Angle has authority for his assertion, if he takes up the text-books on

Dr. J. Bond Littig. the subject of orthodontia as published to-day—that the majority of temporary teeth erupt normally—I remember when I was a young man that Dr. Bogue read a paper before the Odontological Society, which was written by Dr. Davenport, stating that there should be no extraction of teeth for the purpose of "regulating," as we used the term then. We were really anxious about Dr. Bogue at that time; we thought he was getting a little off his head, and so men brought models invariably, to prove that extraction of teeth was not detrimental to the shape of the arch and mastication. Dr. Bogue has kept at that all the time, until he is almost like Mrs. Eddy, with a congregation around him, and the people have come forth and said he is right. He was first to indicate to us that we must not extract; that there was something better. He tells us that the teeth of the infant or the teeth of the child of seven, of six or of three years of age, are often entirely irregular, and I rather think he is right. It is an awakening to me, because I have always taken up all these things, and all I have seen, with three exceptions, have appeared to be regular; but perhaps I did not go back far enough. He is one of these men that is always searching for something radical, and he comes out with it and I do not dispute it for fear I might be caught in the same trap as when I disputed him about the extraction of teeth. I am convinced I have extracted many teeth that should not have been removed. I was taught that way, and that is my only excuse. Facts are stubborn things, and when Dr. Bogue brings



ITEMS OF INTEREST

models and appliances you can see how ingenious he is. Not that he has invented appliances, but he has taken those from Ainsworth, Canning and others and has correlated those appliances to suit individual cases. Not many of us would have thought of it.

I have been much interested in this work Dr.

Dr. Hawley. Bogue has been doing, and it is needless to say I have been much gratified by it.

In regard to the first part of the paper, from one standpoint of the proposition, that the temporary teeth guide the permanent ones into a perfect position, I think Dr. Angle was right. That is, in case the temporary teeth are normal, and none of them lost prematurely, and I do not question but that the first molar, in normal cases, is the most valuable landmark for classification in the mouth. But it seems to me that any man will notice that in a large number of cases the temporary teeth are not in normal position, and in those cases they do not guide the first molars into normal occlusion.

I think there can be no question but that there are large numbers of cases where the temporary teeth are not in normal occlusion. I have observed many myself, and Dr. Bogue has shown some on the screen. I have had two cases called to my attention since I have been in this city of complete distal occlusion in the deciduous teeth. In those cases the first molar will hardly be guided into its normal position.

Regarding the second part of the paper, I saw these appliances last July, and I must say that Dr. Bogue was attempting something I would not care to undertake myself. Last night I saw the models of this case and I am certainly astonished at the results that have been attained. The arch was bent with just about the right amount of spring, because in four months it has widened that arch just a little more than is necessary (if my charts are right), and that extra expansion is very vital considering the retention. I think if I had that arch under my constant control I should have exceeded the indicated width by just about the amount that he had done. I would compliment Dr. Bogue very highly because of the way in which he has adjusted those appliances. I think it is remarkable. He has opened a field of possibilities in managing such cases that I have not thought of, and I do not believe many of us have. This patient has been out of his control for four months, and yet the appliance has worked correctly. Only a little more attention to the lower arch was needed.

I can hardly express my gratification at the results that have been gained by Dr. Bogue.

I had the courtesy shown me of being permitted to read Dr. Bogue's paper, and of also seeing the models and hearing him explain the working of his appliance. He has certainly given us a marvelous apparatus; especially marvelous for those cases where we can not see our patient two or three times a week, or even once a week.

I think the Doctor's criticism of Dr. Angle and Dr. Brady with reference to their position as to irregularities in the temporary teeth is well taken. Dr. Bogue, as you know, has been working along these lines for some time. He expressed his conviction over three years ago that certain irregularities were shown in the temporary teeth, and that operations on them should be started very early.

Last July I published an editorial criticism of Dr. Angle's statement with reference to the first permanent molars, saying "that they could not be the key to diagnosis when posterior to any irregularity of the temporary teeth." Later I had an article in December, 1906, *Dentist's Magazine*, covering irregularities of the temporary teeth, wherein I stated that all serious irregularities of the permanent teeth are foreshown in the temporary dentition. It is not a mere statement, but the results of the investigations of some years.

Dr. W. M. Dailey published a paper in 1905 indicating that he had observed the prevalence of irregularity in temporary teeth.

I am surprised to hear Dr. Hawley say that most of these irregularities are not shown in temporary teeth.

In the first class of Dr. Angle's classification there are 692 out of a thousand cases in which the irregularities in permanent teeth are anterior to the first permanent molars. Indications of those irregularities would show in the temporary teeth. If you do not believe it, watch the little patients. Ask the mothers to bring in the sisters and brothers of the patients under your care, see the babies soon after birth, and note the characteristic lip relations, etc. Get impressions from two years and ten months up, as I have done, and you will conclude as I have, that temporary irregularities precede those of the permanent.

I disagree with Dr. Bogue on one point. That is, we need not pay a great deal of attention to pre-natal conditions. This need not detract in any way from post-natal conditions. C. Stanley Hall, in his "Psychology of Adolescence," says: "One of the greatest causes of the decay of ethnic stock is loss of mammary function."

What did that mean? That child does not get enough nutrition, and does not develop thoroughly because the conditions are wrong with the mother. We must consider all these things. They are at the very foundation of our work. The irregularities are shown, as Dr. Bogue



has indicated, in the temporary teeth, and I am glad to be able to corroborate his statements and commend his excellent paper.

When I received the programme of this meeting I saw Dr. Bogue's subject dealt with the expansion of dental arches, thereby enlarging nasal passages, etc. It is true the roots of the deciduous teeth will influence the cusps of the permanent teeth beneath them, and make the jaws increase in breadth and length. At eight or nine years of age, however, work on the temporary teeth would not amount to much because of the absorption of the roots of the temporary teeth.

The Doctor's appliance will be a great aid in many cases, but there are more cases where the appliance *will not influence the roots* as much as the crowns. I believe we need to pay more attention to the root positions. Then if they are put right, the crowns must be.

It is some time now since I have looked at my
Dr. Bogue. orthodontia work as the mere regulation of teeth.

That is almost secondary, and that perhaps explains the title of the paper as published in the programme. I can not resist the examination as to narrowed arches, adenoids, imperfect breathing, imperfect nutrition, psychical defects, and all that sort of thing, every time one of these little patients is brought to me. I think it is about six years since the paper was brought before the American Medical Association, in which one case only was described. Whether that case was successful, you may best judge from the fact I have had the sister, and now have another brother. Those children all had adenoids. There was an effort at recurrence in one of them. Once the expansion arches were put on, there was no further recurrence of adenoids. I do not recall a single case where there was a recurrence after our work was done, which shows the relationship between naso-pharyngeal difficulties and orthodontia.

I think Dr. Barnes, in referring to pre-natal conditions speaking of children who fail of proper nutrition before and after birth, touched upon a point of which all of us know too little.

Dr. Pullen asked me to speak as to the difference between spring and intermittent pressure. A few years ago my whole attention was given to the inclined plane and screw, but when I got hold of Dr. Ainsworth and his apparatus, and saw the patients, I began to wonder if something else would not answer as well, and maybe a little better. I have applied it now, I think, in about forty-two cases, and I am firmly convinced of its effectiveness. In the case of the little girl I have told you of, the apparatus was arranged without any pain, and from July until November, when the orthodontist took the fixtures off, absolutely no suffering was experienced by the child. She did not know what was

being done. I think that instance would also answer Dr. Pullen's question as to the propriety of using this apparatus.

The apparatus which I have taken pleasure in showing you to-day is not adapted to a great many cases, but I hope it may be of service to my brethren some day in the proper cases. One more reason for bringing it before you is that it shows a way in which multitudes who have not the wealth to apply, say to any of you gentlemen, for relief, may yet have the recourse of going to some one who will come up and be able to apply fixtures, and will do the work at a price within their means.

I owe also to Dr. Ainsworth the inception of the idea of putting on fixtures and leaving them there to do their work. It is not all original; I think he said it was an accident in his case; I do not wish to claim that at all.

A Case of Double Resection of the Mandible.

By W. O. TALBOT, D.D.S., Biloxi, Miss.

Read before the American Society of Orthodontists.

For several years there have been rumors of a case of double resection of the mandible in New Orleans. The operation was said to have been performed for the purpose of reducing the protrusion of the lower jaw. Since marked cases of protrusion of the lower jaw are so common in this city, and there has been only one or two other such operations authentically reported, and since this class of cases is the most difficult for the orthodontist to handle successfully, I have been particularly interested in learning the facts connected with this case, and the results obtained.

About four years ago a male person, age 38, presented himself to a surgeon in New Orleans and asked to have a portion of his lower jaw removed to reduce the prominence of his chin. This was an extreme case and the prominence most disfiguring. The surgeon advised against the operation, but the patient insisted and said that he was determined to have the operation performed, as he had heard that it could be done. Other surgeons were called in and the operation finally determined upon. The resection was made on each side mesial and distal to the first molars, which teeth with their contiguous bone were removed. This operation severed the nerve and the principal blood supply of the anterior section



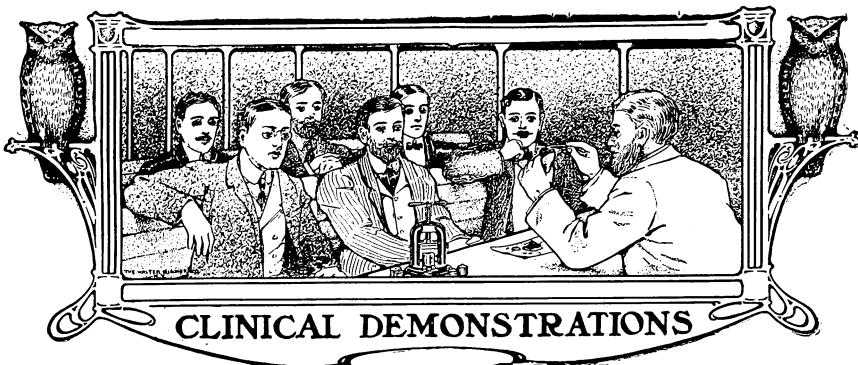
of the jaw. The bones were drawn together and held by wires passed through each of the ends. No splint was used in this case. Necrosis followed the operation, and it was some time before the patient recovered. In this case a deformity was corrected, and finally there was some union of the bone, but it is questionable if the patient was greatly improved, as there was a disfigurement on each side opposite the field of operation and the symphysis dropped down. The patient is now able to chew a little. The surgeons in this case recognized the error in operating so far back on the body of the jaw, and now say that they consider the region of the first bicuspid the proper field for operation in such case.

Discussion.

Dr. McKay. Provided this is the case I think it is, I have heard it commented upon several times. It has been pointed to as a botch of what could be a proper operation if done according to a correct method. It was done very clumsily, and this case should not be accepted as evidence that such an operation is not warranted in certain conditions.

Dr. Ottolengui. Any deformity is possible. I am willing to go on record as saying that a real protrusion of the lower jaw is even rarer than a real protrusion of the upper. So-called protrusions of the upper jaw have been so diminished in numbers and the extent of the protrusions that a real protrusion is beginning to be looked upon as rare. I have seen a number of what we call Class 3 cases, and it has been perfectly marvelous after treatment and correction—which naturally did not shorten the mandible any—how different the profile would look when the upper jaw had been developed.

In the great majority of these cases, if the upper jaw is fully developed by treatment, and the lower teeth are really moved further out instead of further back, the apparent protrusion of the chin will disappear.



To Construct a Removable Bridge from Sound Cuspid to Second or Third Molar.

By A. T. SAWYER, D.D.S., MANCHESTER, N. H.

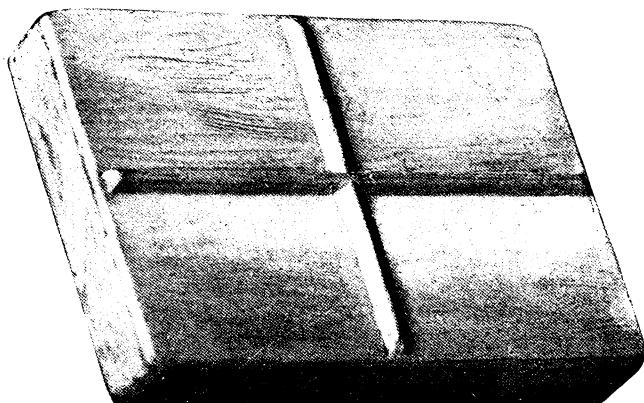
First remove pulp in cuspid, fill canal, burnish No. 30 pure gold to cover the palatal and approximal surfaces of this tooth; enlarge the canal and make platinum tube of No. 30 guage.

This is passed through the gold, already burnished to the palatal portion, and into the enlarged canal, and the tube and crown plate, as we will call it, soldered together and re-burnished and then reinforced with more solder, cemented into place and finished on tooth. The end of the tube in root is of course closed. Into this tube an iridio-platinum wire is adjusted and this is soldered to a smaller crown plate which has been burnished to fit the one already cemented on the tooth. This wire, when slightly bent, makes a secure attachment for the anterior end of the bridge, with no gold in sight.

A saddle is then swedged to fit the ridge, of either gold or platinum No. 30, and the molar is crowned with gold, and attachment is made to it by any of the well known attachments, such as the Griswold; or what I think is better, make sides of crown straight and then make a band of clasp metal to fit accurately around this crown, and from this band down to the gum have a supplementary band soldered to the crown, thus forming a shoulder on which the clasp metal band can rest. To this clasp metal band the other end of the bridge is attached and held securely.

Now grind into position on saddle plain plate teeth and back with No. 35 pure gold, allowing this backing to extend down lingual side and

under tooth until it meets saddle on the ridge. Invest, solder and finish, and bridge is complete and ready to go into the mouth, and will prove a joy to the patient and a satisfaction to him who made it.



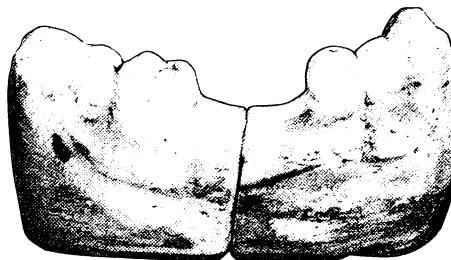
B

Why the Bridge Binds and a Method to Insure Success.

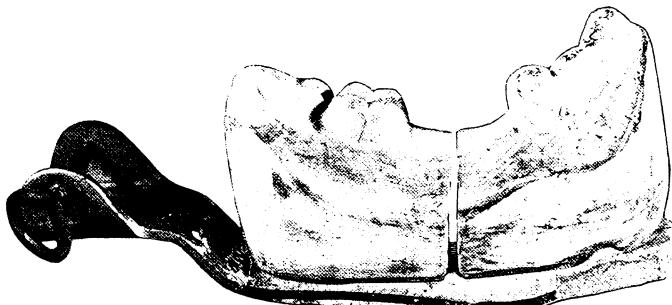
Clinic by H. E. HOLSEY, D.D.S., Springfield, Mass.

In soldering a bridge with two abutments the shrinkage of the solder draws the abutments closer together, hence the bridge binds when placed in the mouth. Run the impression and place plaster side down on slab (Fig. A). The slab is made of plaster with two ridges forming a cross

on the upper surface. It is shellaced and oiled to allow removal of the model (Fig. B). Oil the model on the grooved side and proceed to get up the articulation in the usual manner, being careful that plaster is not carried over sides of model, preventing a ready removal of same from articulator. After plaster has hardened remove model from articulator,



C



D

and saw nearly through at the transverse groove on underside. Now break the model that you may have a clean fracture. This is shown in Fig. C. The model is now fitted upon the ridges upon the articulator and separated the required distance. Having a space of one-half inch between abutments, separate cast one sixty-fourth of an inch; larger space in proportion. Fig. D shows separated model on articulator. Next proceed to make up bridge. When removing bridge for investment if you wish to solder on model saw down outside of the abutment; the bridge portion of the model can be removed without disturbing relations of the separated parts. A little practice will soon prove this a success which will be a source of satisfaction to yourself and patient when the bridge is placed in position. I have used this method six years and it is practical and successful.



Method of Using Inlay Gold in Making an Open Face Crown.

By W. H. HOYL, D.D.S., Dawson, Ga.

I believe we all agree in saying there are cases when the open face crown is clearly indicated, the great hindrance being in making a perfect adaptation. Follow the details of this method carefully, and I believe you will be pleased with the result.

Take the impression of the tooth to be crowned in plaster, producing a plaster model; trim model at cervical margin carefully with view of having finished crown extend under free margin of gum. Make impression in mouldine and run model in Melotte's metal. Polish metal model with cuttle-fish disk. Take inlay gold (preferably 24 k. one one-thousandth), cut a piece sufficiently large to cover the labial, and one for the lingual surfaces, cutting it large enough for overlap of one thirty-second of an inch in interdental spaces. With the assistance of slightly softened modeling composition you can readily approximately adapt this inlay gold to the metal model. For more perfect swaging, place the two sides of the crown in position on the metal model, and over this place the metal ring which comes with all mouldine outfits, and it being of same size rests firmly upon edges of model. Fill the ring flush with wet cotton, and pack it down with a wooden piston (home made), tapping it lightly with an ordinary hammer. Remove cotton and you will find the two sides of the crown stuck together, and they can be removed from metal model without disturbing this relation. Now place the perfectly swaged crown on asbestos mat, and with a small piece of 22 k. solder unite the two sides. Place on plaster model and cut out face with carborundum stone. Try on natural tooth and with oval burnisher adapt margins as you would in case of making an inlay filling. We now have a perfect matrix of the tooth to be crowned. Invest it by means of filling the crown, or matrix, with investment material, either fine marble dust or sump, bringing to a heat, and flow 22 k. solder over the entire surface. Finish just as you would an inlay filling.

PROSTHODONTIA

Ideal Articulation of the Teeth Considered in Relation to Porcelain Dentures.

By DR. STEWART J. SPENCE, Chattanooga, Tenn.

III.

Having considered the placing of our casts on the articulator, let us proceed to the placing of the teeth on the models. And first we will consider the position of the teeth as a whole.

The distance from the lower last buccal cusp of the third molar on one side of the mouth to the similar cusp on the other side should be equal to the distance from either of these cusps to the lower incisor point.

Fig. 11 illustrates this rule, *a b* being the positions of the condyles, and the corners of the triangle *c d e* being the points in the upper teeth where occlude the points of the lower teeth specified in the rule. It will be observed that not only is the lower jaw an equilateral triangle (*a b e*) but also that the human denture is also an equilateral triangle, *c d* being equal to *d e* and to *e c*.

Various measurements taken from nature by the writer show that the average length of the line *c d* (or *d e* or *e c*) is two and one-quarter inches; that it rarely goes above two and three-eighths inches or falls below two and one-eighth. (This makes the distance from the last molar to the *X* joint—the line *d b* in the figure—about one and three-quarter inches.) This measurement from molar to molar (*c* to *d*) is much more than that of most artificial dentures; my measurements of nine plates give only one and seven-eighth inches as the average width—about three-eighths of an inch below nature's.

It must not be supposed that when the third molar is omitted from the porcelain denture the similar point in the disto-occlusal border of the second molar should be made to take the place of the third as the corner of this triangle; on the contrary, it should be, as shown in the figure, located on the arc $g\ h$ (drawn from the point f), which arc marks the occlusal groove of the five upper grinding teeth. This reduces the distance apart of the molars by one-sixteenth of an inch—from two and a quarter to two and three-sixteenth inches.

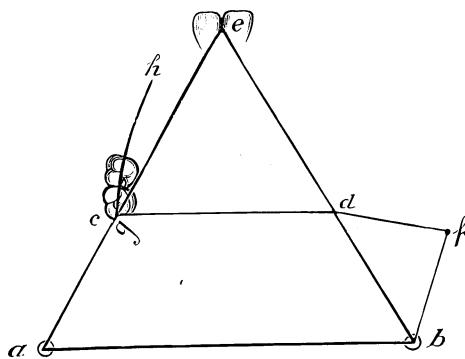


FIG. II.

With regard to this arc $g\ h$, some writers claim that this occlusal groove of the five grinders should run in a straight line, but I have not so found it in any of my models, which have been taken from impressions of very perfect dentures. These show that it has a slight curve—that of a circle about seven inches in diameter. By this means the natural teeth are like staves in a barrel—mutually kept from falling inward. But in prosthetic dentistry this is of little importance. More vital is the question whether the circumstance of alveolar absorption does not so alter the case as to justify the prosthodontist in departing from nature's law with regard to the width between the molars, and placing them closer in under the ridge. Unquestionably tilting of the plate in biting is favored by placing the molars far out, where absorption has removed the support. Also, in such case, the upper plate is apt to crack from the incisors backward along the palate; also molars are liable to break away with the sections of vulcanite. These are important considerations, and in view of them the writer deems a moderate departure from nature's law sometimes advisable. On the other hand, it should be said that correct articulation of the teeth reduces greatly the liability to tilting of plate in biting; and it should be remembered that whatever is gained

for the upper plate by setting its molars inward is gained at the expense of the lower plate, the molars of which are thus crowded inward also, away from the supporting ridge, and caused to invade the realm of the tongue.

I am aware that this evil is frequently remedied in practice by reversing the natural occlusion of the last one or two molars, by placing the lower ones buccally to the upper. Not to mention that this crossing of the occlusal surfaces interferes with the correct articulation of these



FIG. 12.

teeth, especially if long-cusped, it is open to the serious objection that it reduces by about fifty per cent. the surface employed in mastication. This is illustrated by Figs. 12 and 13.

Fig. 12 shows molars thus crossed, and in full occlusion. Fig. 13 shows the same teeth when the return movement of the lateral bite ($c\alpha$ of Fig. 2) is commencing. The right molars are seen to occlude very nicely, their entire occlusal surfaces coming together, but this is of no



FIG. 13.

use, because in this lateral bite the food is between the left teeth, which will occlude and grind only while α in Fig. 12 is returning to the position of α in Fig. 13.

It should be remembered that absorption in the lower jaw takes place, as regards the molars, entirely on its lingual aspect. By placing the molars where nature placed hers, instead of trying to make them ride the receded ridge, and by opening the bite as wide as did nature (which for some reason—probably to avoid exposure of the pink rubber gums—is rarely done) it is often no difficult matter to find room for the third molar; and if needs be that it be ground so thin as to be likely to fracture in use, the porcelain may be removed before packing and a vulcanite tooth allowed to appear in its stead. Often, also, it is well to invert the position of the second and third molars—turning their pin-heads toward the cheek.

Rule 10. *The twelve anterior upper teeth—that is, from the incisors to the first molars, inclusive—should be so placed that their incising edges and buccal cusps are all on the same plane; the second and third molars rising abruptly from said plane.*

For an illustration from nature of this rule see the line *k l* in Fig. 3. This line is not shaped with the incisors lower than the bicuspids* (Fig. 14); still less is it shaped with the incisors higher than the bicuspids (Fig. 15) (a very common defect of porcelain dentures, due to dentists using short-bite teeth where lower teeth, having long-bite, remain);



FIG. 14.



FIG. 15.



FIG. 16.

but this line is shaped as in Fig. 16, that is, the line is straight from the first molar forward. This form seems the most beautiful. The case is different with the lower teeth, for with them the overbite (or, as Dr. G. B. Snow more properly terms it, the underbite) must be allowed for, which causes the occlusal plane to assume a bow shape, as in *a b*, Fig. 17.

Here only the first molar and second bicuspid are on the level line *c d*, for the last two molars rise above it at one end and the four front teeth (beginning at the first bicuspid) rise above it at the other end, each end rising to equal height with the other. For in order that the occlusal plane shall be as nearly on a level with the *X* joint as its curvilinear form permits, it must be that its last buccal molar cusp rises as far above the line *c d* as does its incisor point. For it is evident that if the occlusal plane were placed relative to the *X* joint, as are either of the curved lines *e f* or *g h*, the bite in mastication would be made at a great disadvantage, the food being forced forward in the one position and backward in the other; therefore an equilibrium of these two positions must

*Perhaps it is only fair to say that Dr. Kingsley, in "Oral Deformities," p. 499, takes an opposite view.

PROSTHODONTIA

be correct. Accordingly the rule is that a line drawn from the incisor point to the joint of the articulator should touch the last buccal cusp of the lower third molar. A flat instrument, such as a ruler, placed on a lower denture at these two points should, if produced backward, reach to the joint of the articulator. This law, though not imperative, should not be departed from.

By following nature in giving to our two last molars this upward incline of the occlusal plane, we obtain more room than we should otherwise have for the third lower molar. Although not an enthusiastic advocate of the use of the third molar, yet the writer believes its wholesale condemnation to be unjust, and that these despised and rejected "wisdom teeth" can in many cases be used to advantage.

The last molars should occlude, in both the incising and lateral bites, simultaneously with the incisors, in order to accomplish which the occlusal plane of the last molar should incline upward at an angle of about twenty degrees from the plane of the twelve upper anterior teeth mentioned in Rule V.

The object of this arrangement is to prevent dislodgment of the plates during the lateral and incising bites. Without it contact would occur only at incisors, in both these bites, except, of course, where there is no overbite at all. It is also claimed for it that it aids muscular action by affording the muscles on the right side during the lateral bite something to act upon. It is always present in Nature's perfect dentures.

Fig. 3 will help us to understand this rule. Here the line *k l* is the plane of the twelve upper anterior teeth, and *m n* is a line drawn through the occlusal plane of the last molar. This line, it will be observed, is inclined to the line *k l* about twenty degrees. In Nature, the inclination of the occlusal surface of the last molar, in perfect dentures, does not deviate greatly on either side of this angle.

Observe that the rule says "upward incline of the occlusal plane of the *last molar*," not of the last three molars; still less of the entire five grinders. It is not necessary nor advisable that the last three molars should have the same degree of inclination as the last one; for in such case their occlusal plane would be along the line *i j* in Fig. 17; which would necessitate placing the upper bicuspids and first molar lower than the incisors, thus rendering them so conspicuous as to be unsightly. It is true that by placing the molars in this way we could make them all, instead of only the last, occlude when the incising bite is made; but there would be nothing gained thereby; the degree of inclination required for the third molar would not be lessened.

Fig. 18 illustrates the relation of this inclination of the last molar

to the overbite and to the protrusion of the lower jaw in making the incising bite. Here $a b$ is the occlusal plane, b being that part in the upper central incisors where the lower incisors occlude (the e of Fig. 11) and c being the incising edge of said upper incisors. Let d be the X joint, four inches from b and one and three-quarters inches from the last molar at a . Now let the lower incisors drop from b to e , and move forward an equal distance to c , to make the incising bite; simultaneously the lower last molar must drop from a to g , and move forward

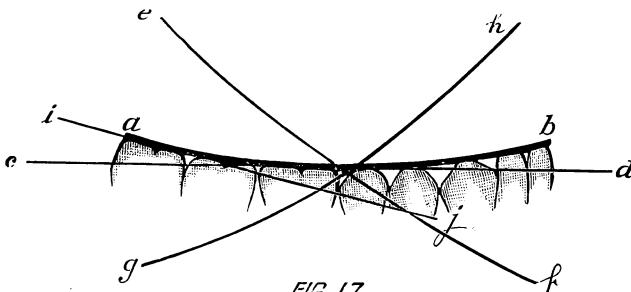


FIG. 17.

to f , at which point contact of the last two molars must recur. The inclination of the line $a f$ is therefore proportionate with that of the line $b c$, and is about that which is usually required in porcelain dentures.

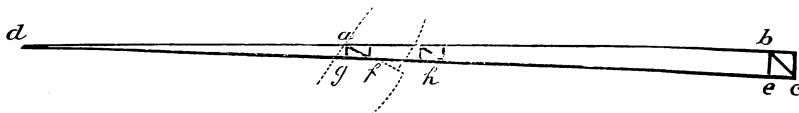


FIG. 18.

Where the third molar is omitted, this line must be slightly steeper, because farther from the X joint, as shown at h in the figure. Its inclination does not differ much if any in differing lengths of overbite, because the protrusion which is needed to make the incising bite is usually equal to the overbite, the line $e c$ being equal to $e b$. Therefore if the overbite be one-eighth of an inch and the protrusion also one-eighth of an inch, the last molar will be carried forward one-eighth of an inch, thus occluding with the upper molars at a point twice as far from a as is f , having at the same time dropped twice as far down, and thus the inclination of the line $a f$ is unchanged. The same is true if the bite is longer or shorter than one-eighth.

It is not certain that nature has any ideal length for the overbite, and in the lymphatic temperament we find it shorter than in the others.

Nevertheless, as one-eighth of an inch is about half the width of a bicuspid, and as, if the overbite be one-eighth of an inch and the protrusion also one-eighth of an inch, the cusps of the bicuspids are brought into vertical opposition and contact when the incising bite is made, therefore it seems somewhat probable that one-eighth of an inch is the ideal overbite for an equally balanced temperament.

We have spoken hitherto as though the upward inclination of the occlusal plane of the last molars were the only factor in securing simultaneous occlusion, but there is another which must be considered: In moving forward to make the incising bite the lower teeth are carried into opposition with a narrower portion of the upper denture, so that the last lower buccal cusp occludes no longer in the upper occlusal groove but some distance up the inner slope of the buccal cusp of the upper molar, thus reducing (in proportion to the steepness of the cusps and the length of the protrusion) the steepness needed in the incline of the occlusal plane.

Where there is no overbite there should be no upward incline at the molars. If any be given to them the lower jaw can not be protruded without causing the incisors to be held apart by these last molars. And the same is true of the lateral bite—the incisors and the left bicuspids and molars would, in such case, be kept from occlusion until the end of said bite, that is, until full occlusion would be reached.

Even where there is overbite, the incisors will be held from contact whenever protrusion of the lower jaw is made farther than just far enough to bring the upper and lower incisors in occlusion in the incising bite; for when during this bite the two inclined planes of the molars come in contact any further protrusion of the lower one causes it to ascend the inclined plane of the upper one, and so to hold apart all teeth anterior to it. The "bull-dog bite," therefore, is impossible under ideal conditions.

Similarly, in the lateral bite the teeth on the left side are held apart by the contact on the right until, in its return movement, the mandible has brought the left lower bicuspids directly vertical with the upper, at which position said left teeth should have come to actual contact in occlusion.

To get both the occlusal plane and also the cusps of these last molars so inclined that in both the lateral and incising bites simultaneous occlusion of molars and incisors will take place, is no easy matter. Fig. I will help us to understand this. Here the arc *f g* shows the path traveled by the last lower right buccal cusp in the lateral bite, while the straight line *f j* shows the path said cusp travels in the incising bite. Now, as the occlusal groove of the upper last molar (or, rather, last two molars; for in the lateral bite this lower cusp engages both), with which said



lower cusp articulates when in full occlusion, occupies a position about midway between these two lines, it is obvious that in traveling the line *f g* said lower cusp ascends the palatal cusp of the upper molar, and in traveling the line *f j* it ascends its buccal cusp, and that it will do this the more that these cusps are steep or that they lie athwart its path. If therefore these occlusions are found on trial to be not made correctly, they should be remedied by altering the direction in which these teeth lie antero-posteriorly, or by inclining them more toward the cheek or toward the palate, as the case may require, or by regrinding. Patience and skill are here required. If the dentist has not this skill, let him sacrifice correctness in the incising bite rather than in the lateral, because the former is comparatively little used, while the latter is made from twenty to thirty times for each morsel of food.

It is difficult with the articulators on the market to decide when these two bites are correct. With them the dentist in examining the case has to force back the upper teeth against their resisting springs and hold them as best he may with the incisors edge to edge in front while he tries to make his examination at the back. This is next to impossible. The writer has overcome this difficulty in his articulator by adding to it two little screws, which are made to hold the jaws in the incising and lateral bite positions—the incising, by turning in both screws, the lateral by turning in but one.

The length of the cusps should be in proportion

Rule VII. *to the overbite; long when it is long, short when it is short.*

If the overbite be longer proportionately than the cusps, it must follow that in the lateral bite the cusps will fail to mash correctly, being held apart by the occluded incisors. This will be particularly manifest in the bicuspids. The overbite of the bicuspid (which is the length of their cusps) is but little less than that of the incisors.

In the lateral bite the buccal cusps of each jaw

Rule VIII. *should interlock with the buccal cusps of the opposite jaw.*

The human denture has four ways of comminuting food—by incising, rending, grinding and crushing. Each of these must be fully conserved in the porcelain denture in order to copy the ideal. The rending, which is very important, can not be performed with cuspless teeth, and but imperfectly with short cusps, or with cusps that do not correctly occlude. This important factor is greatly neglected by prosthodontists.

This rending is performed in two ways: (a) by the food being stretched and torn by the cusps, particularly those of the bicuspids, while

they are in the act of passing each other in the lateral bite; (b) and by the food being stretched over the occlusal eminences which extend bucco-lingually across the occlusal groove. Fig. 19 shows the teeth in the first of these two, exhibiting their cusps in normal occlusion, as seen from the buccal aspect. On the lingual side of these same teeth the cusps should be somewhat similarly interlocked, though not in actual contact, being held apart a millimeter, as shown in Fig. 22.

The occlusal eminences, above referred to as the second factors in



FIG. 19.

the stretching and rending of food, are extensions of the bases of some of the cusps, reaching across the occlusal valley and making of it a series of basins instead of one long trough. (It need not be pointed out that this beautiful device of nature is more effective for mastication than would be a trough.) Into these basins occlude the cusps of the opposite

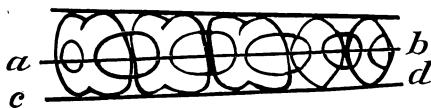


FIG. 20:

jaw, the occlusal eminences of each row of teeth occluding with the basins which stretch across the interdental spaces of the other. Fig. 20 roughly shows in diagram fashion the locations of these basins in the upper teeth; the occlusal eminences being, of course, shown by the spaces between the basins.

Unfortunately, in grinding to correct depth the occlusal grooves of the porcelain teeth of commerce, the dentist is usually compelled to obliterate whatever there is of these occlusal eminences in the molars, so reducing the grooves to a mere trough; but in the bicuspids they can easily be preserved.

Fig. 20 correctly represents some other facts: (1) that the occlusal groove (*a b*) is equally distant throughout its entire length from the buccal border *c d*; (2) that the five upper grinding teeth gradually increase in width bucco-palatally as they proceed posteriorly; (3) and that



ITEMS OF INTEREST

this increase is all in the palatal side of the occlusal groove. In the lower teeth, the reverse obtains.

The buccal cusps of both upper and lower teeth should decrease in height as they proceed posteriorly in the degree that if carried backward to the X joint they would be reduced to nil.

This is illustrated in Fig. 19, where the buccal cusps are seen to decrease in height from one-eighth inch at the first bicuspid to one-twelfth inch at the third molar, the angle *a* representing the *X* joint. (In order to illustrate this decrease the upward incline of the second and third molars has been omitted in the figure.)

As the buccal cusps of one jaw must be equal in height to the buccal cusps of the other jaw, that they may mash together correctly (as in Fig. 19), and as the cusps indicate the depth of the occlusal groove (this being formed by them as a valley is formed by surrounding mountains) *it follows that if the cusps are of the height to mash together correctly they must be of the right height to reach to the bottom of the occlusal groove.* The dentist has therefore only to grind out his groove until the cusps properly interlock in the lateral bite, and said groove will be of correct depth.

Beginning with the first molar, the axes of the posterior teeth should increasingly incline, the upper inclining buccally, and the lower lingually; so that the palatal cusps of the upper teeth shall be increasingly longer as they proceed posteriorly and the lingual cusps of the lower teeth increasingly shorter.

Nature's object in thus tilting the molars is not obvious. No doubt there is some advantage in it, and yet an excellent denture can be made of teeth not so arranged, but with the four rows of buccal and lingual cusps equally high.

Nature's arrangement is shown in Fig. 21, except that the upward incline of the occlusal plane of the second and third molars is here omitted in order to exhibit by straight lines the heights of the cusps. In this figure the inner cusps are drawn in thin lines; the buccal in thick. In the three upper molars these inner cusps can actually be seen, but in the upper bicuspid and all the five lower teeth they are supposed to be seen through the tooth. Parallel with the line *a b*, which gives the line of the upper palatal cusps, are the lines *e f* and *c d*, the first of which marks the position of the lower palatal groove, into which said upper palatal cusps articulate in the full occlusion bite, and the second of which—the *c d* line—marks the line of the lower lingual molar cusps, with which said upper palatal cusps occlude during the rending part of the lateral bite.

or rather, *almost* occlude. I say "almost," because for some reason not clearly apparent, but possibly because a little oozing out of the food permits that which remains in the dental mill to be more thoroughly crushed; nature does not bring the palatal and lingual cusps quite in contact during the lateral bite, but (as already remarked) allows a separation of about one-thirty-second inch, as is illustrated in Fig. 22.

Fig. 21 shows also the heights of the two lingual cusps of the lower bicuspids, the first of which is usually short, as though undeveloped—not that it could not, if high, be of use in mastication, but probably it interferes slightly with the tongue; or possibly because nature, in esthetic

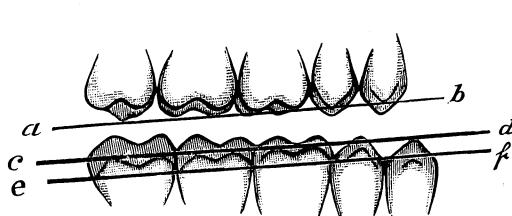


FIG. 21.

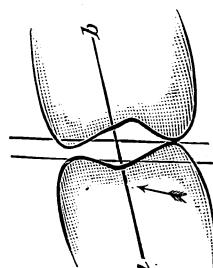


FIG. 22.

mood, saw it to be unsightly. In the second bicuspid the lingual cusp shoots up to a height nearly equal to the first lingual cusp of the adjoining molar. This molar cusp is the highest of the lower lingual cusps, articulating in the large intercuspal space made by the recession of the first palatal cusp of the first upper molar. From this highest point the lower lingual cusps decrease in height as they proceed posteriorly, as shown in Fig. 21.

When either the upper or lower molars are examined out of the mouth, their buccal and lingual rows of cusps are seen to be of equal length; it is only when seen in the mouth that they are as above described. In looking at them out of the mouth we naturally hold them upright, but in the mouth their axes incline, the inclination increasing from the first to the third molars, where it is about as shown by the line *a b* in Fig. 22. This tilted position gives to the lower molars the appearance of having their occlusal groove located quite far lingually, while in reality it is only slightly so.

As therefore the palatal cusps of the upper molars are, when in the mouth, longer than the buccal, and the buccal cusps of the lower molars longer than the lingual, it follows that when these two higher cusps

occlude (as they do in the lateral bite) all the rest of the teeth in the mouth are kept from occluding. True, but this occurs only when these teeth are in contact *at their highest points*, which is only when the lateral bite is at its extreme reach; and at such time the food, which is between the teeth on the left, counterbalances this pressure on the right; and by the time the left teeth have come inward far enough for their buccal cusps to be in vertical opposition, as in Fig. 19, the high cusps on the

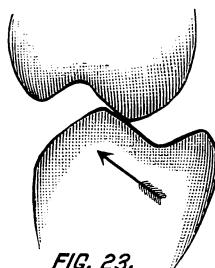


FIG. 23.

right have descended from their highest points of contact to about the position shown in Fig. 23, thus permitting contact on the left as soon as needed. (Compare this with paragraph 9 of Rule VI.)

The cuspal borders of the bicuspids and molars should be sharp-edged.

Rule XI.

This rule, though last, is not least. Nature intended the masticatory apparatus for cutting as well as for rending and crushing; and cutting can not be done with blunt tools. Contrast the little blunt-edged, harmless-looking thing, the molar with which commerce supplies us, with the ferocious-looking spiked-and-grooved weapon which nature puts into the mouth, even at the early age of six years, and there will be no doubt which one was meant for preparing the tough muscles of the ox for the human stomach.

The worn teeth of the adult ought not to be our criterion, for in them the cusps—especially the upper palatal and lower buccal—are often found rounded from attrition, whereas originally they were keen.

The cutting quality of a tooth is greatly increased by length of cusp, and the longer the cusp the more apt it is to be keen-edged; but even short-cusped teeth may have sharp edges. The occlusal groove should be similarly angular, resembling a V rather than a U. To give this shape to said groove, a keen-edged grinding-stone is required. The writer uses one which he has brought to a V shape at its periphery by grinding it on another wheel. Carborundum wheels will cut one another very readily.

Modification of Manufactured Teeth Advocated.

As teeth are now made it becomes necessary to grind their occlusal surfaces in order to get scientific articulation. This sacrifices the occlusal eminences and corrugations of the molars. Besides, it is a very difficult thing to do correctly, for the occlusal surface of each grinding tooth has four inclined surfaces (see Fig. 23), three of which occlude.

Now, to get these six inclines (three in each jaw) ground so as to fit perfectly is well-nigh impossible. *All this could be avoided by the manufacturers.* If they would make teeth according to nature's patterns, and make the upper and lower teeth to correctly occlude with each other, it would be comparatively child's play to set up scientifically articulated porcelain dentures. If the manufacturers would also abandon the thousand and one molds on the market, and agree together to use only similar and a very few molds, how easily then might the dentist obtain the exact size and shape of any tooth required in all ordinary cases! If there were but nine or twelve different molds on the market for bicuspids and molars, and a somewhat greater variety for incisors and cuspids, how much trouble and annoyance would be saved to both salesmen and dentist, and how much better dentures would be produced! There would need be—at least for plain teeth—only three sizes of occlusal surface for bicuspids and molars; and these three sizes would need to be each furnished with only three or four different lengths of cusps, for overbites of say 1-32, 1-16, 1-8 and 3-16 inch; and as long cusps accompany long crowns, there would be no need of special provision for the latter. Thus about a dozen molds would supply the needs of all ordinary cases in the grinding teeth, and abnormal cases could be specially provided for by special molds. It is pleasant to see that as time goes by there are improvements both in the shape of our porcelain teeth and in articulators, and that we shall yet succeed in obtaining perfect teeth and perfect articulators, so that we may make perfect porcelain dentures, built according to nature's ideals. Not only is this "a consummation devoutly to be hoped for," but one that may reasonably be expected to arrive before the expiration of the twentieth century.



SOCIETY PAPERS



A Few Facts in Connection with Root Canal Treatment.

By WILLIAM E. TRUEX, D.D.S.

Read before the Monmouth County Dental Society May 3, 1907.

It is with some hesitancy that I bring before you such a hackneyed subject as a proper material for a root canal filling, and with considerable timidity that I attempt to treat it in the manner proposed. I, however, will not bore you with a lengthy description of my method of filling root canals, as I have no method, and realizing my limitations from a scientific standpoint, I desire to call your attention only to some of my observations in connection with my own work and the work of others for the past twenty-five years.

As a prelude, permit me to say that a man must have the courage of his convictions to a marked degree to advocate before such a body as this a method of root canal fillings, so long ago become obsolete and quite universally condemned, and I do not advocate it in the sense that I would have you abandon other and more approved filling materials in all cases. But I would have you try this method in obstinate cases of abscessed teeth where no fistula exists, and in acute cases of periodontitis due to gangrenous or putrescent pulp.

The method is the use of wood creosote upon shreds of cotton as a dressing for root canals that are putrescent; as a permanent (?) filling in root canals that may possibly become putrescent because of inability from any cause to remove every portion of a devitalized pulp; and as a treatment without surgical interference for

Wood Creosote in Root Canals.

shreds of cotton as a dressing for root canals that are putrescent; as a permanent (?) filling in root canals that may possibly become putrescent



SOCIETY PAPERS

those cases of alveolar abscess, without fistula, that have, owing to a low state of vitality in the individual, or a strumatic diathesis, absolutely refused to yield to other treatment.

I will relate just one or two cases. While I

Case 1. was still a student I was shown a tooth, an upper

molar, that was extracted the previous day for the purpose of inserting a denture; it had been treated twelve years before, and the roots filled with shreds of cotton saturated with creosote. In my presence the roots, three in number, were broken halfway between the neck of the tooth and the apices of the roots, and there was present the distinct odor of the medicament used, creosote, and absolutely no evident putrescence, and no discoloration. I am fully aware that this condition can, and does, exist in thousands of cases where other materials are used, but this and many other cases prove that it may exist where creosote and cotton are used as a root canal filling.

Twenty-two years ago there came to me a

Case 2. school girl about eighteen years of age, who some months before had had a left upper central or lateral

filled with gold. For some reason the pulps had died and two separate abscesses had formed. The inflammatory process was so inactive that no fistula was formed, due, of course, to the fact that the leukocytes and the pathogenic bacteria were so evenly matched that neither could obtain the supremacy. Yet the bone was denuded of its periosteum, a portion of the alveolus was absorbed and the two abscesses were united. The teeth were opened upon the palatal surfaces, and after treatment with only creosote for a number of weeks, during which time a physician advised extraction, the discharge ceased, and the canals were filled with cones of cotton saturated with creosote; but as the apices were large owing to absorption that had taken place, the ends of the cotton cones before inserting were dipped in chloropercha and gently forced in position, and the operation completed as usual. To-day those teeth are doing good service, never having been disturbed; at no time has there been any inflammation of the pericementum, and no more discoloration than existed when the teeth were treated. The woman has married, given birth to five children, and once had a severe attack of pneumonia.

Another case of more recent date. About one

Case 3. year ago a friend and fellow practitioner in a neighboring town related a case of an inferior bicuspid

with a blind sac at the apex of the root that had persistently refused to yield to any treatment at his hands, always causing trouble when closed. I said "use creosote," and at the fourth sitting subsequently the tooth was closed and has remained so since, about one year.



ITEMS OF INTEREST

Reports of these cases could be prolonged, but these are sufficient to demonstrate the practical use of wood creosote as a dressing in the treatment of at least a few special cases, and possibly sufficient reason why, in spite of its extremely disagreeable odor, it should occupy a place in our cabinet. As to the ready removal of such dressing or filling, when used as a permanent (?) root filling, as compared with the more positive ones, many of us can testify. How much oftener trouble ensues with this treatment than with other methods I am not prepared to state, but I am convinced that from the patient's standpoint, where easy relief is the point in question, at least five such cases will not nearly equal one dense or positive one difficult of removal.

In this connection permit me to quote from no less authority than the late Professor J. Foster Flagg, whom I knew intimately and well, and with whom I have discussed this matter many times. He says in his "New Departure Papers": "I have followed six thousand cases of treated teeth which had to be retreated, six thousand cases of teeth in connection with which pulp cavity or canal work had been, from some cause or another, a feature in the treatment, and in those six thousand cases, of which some were excellently well treated, others not so well, and others poorly treated, nine in every ten had given trouble before twenty years of that tooth's life had passed over."

I have filled upward of four thousand, I will not say pulpless teeth (I have tried to have them pulpless), but devitalized teeth, and in doing so have used almost every known method, and I am frank to confess that the percentage of failures with the so-called permanent canal filling and those so-called temporary dressings containing a medicament so applied as to make removal and retreatment easy, are about equal; but because of the difficulty of removal of the one and the easy removal of the other, the difficult ones seem to outnumber the others as ten to one.

**Requirements
in Canal Filling.** I believe that good results, shall I say the best result? in root canal filling can be obtained by filling with medicaments that are slightly non-poisonous, non-irritating and of long continued anti-septic properties; and that these should be introduced in fluid, semi-fluid or paste form, or possibly upon a vehicle which absolutely maintains its integrity. Again, that the filling should fill as perfectly as possible in order to prevent the entrance of moisture into the canal and thus add more material for decomposition and formation of mephitic gas. Again, the filling should be easy of introduction, not that this is essential, but all else being equal, it is at least desirable; last, but not least, it should be easy of removal, which attribute, while it is of little



SOCIETY PAPERS

consequence at the time of introduction, becomes of paramount importance to the patient if, in the course of time, say ten to twenty years, it means the long continuance of suffering or the affording of prompt and easy relief.

The medicaments of which I can best speak are those which I have used the longest, and none have I used longer and with better results, where it is especially desired to get a result (in difficult cases), than wood creosote.

Tricresol and Formalin Treatment.

Just a word concerning the much talked of Buckley treatment of putrescent root canals, tricresol, formalin and alcohol. I have used this treatment with most excellent results, and I am convinced that

at least much of the good that is in it results from the presence of creosote in the combination: Creosote, a distillate from wood tar; tricresol, a combination of the three cresols; orthocresol, metacresol and paracresol, each a phenol from either coal or wood tar.

It is claimed, I believe, that with the Buckley treatment the dressing can be introduced into a canal that is putrescent and sealed therein, and that through a chemical action of the tricresol and formalin, a complete change of the character of the contents of that root occurs, rendering inert its contents. Whether this is the case or not, of course I do not know, but I do know that I have been doing for twenty-five years just such things with creosote that many, if not all of us, are doing today with the now celebrated Buckley treatment.

Of my failures, gentlemen, and there are many, probably my co-laborers can tell us more than I can or would probably care to relate if I could, but suffice it to say, that I feel highly honored to present the substance of this paper to the Monmouth County Dental Society, and hope you will discuss it, yet hope you will not too harshly condemn it until you have proved the falsity of the statements contained therein or demonstrated to your satisfaction its usefulness.





The Problem of Interchange.

Periodically the cry goes up for reciprocity; for interchange of dental licenses. "If a man is good enough dentist to practice in one State, he is good enough for any State." Is this true? It sounds logical, at first, but it does not bear analysis. The theory is correct, but the application is faulty.

A peck is a peck in all States; a pint is a pint, and a pound is a pound. All miles are of the same length, and all acres have the same dimensions. But the measure of a dentist varies in all parts of this country; hence the fallacy of declaring that a dentist good enough for one State is good enough for all. Undoubtedly there are dentists in all States capable of practicing in any State. But passing to the opposite extreme, there are dentists practicing in all States that are not fit to practice in any State, which shows the defects in the methods of measurement, and the error of demanding interchange of all licenses, without restrictions.

This leads to a consideration of licenses, and **State Standards in Dentistry** the reasons for their existence. Broadly speaking, dental licenses are made requisite as a protection to the public, and not, as too often supposed, as a benefit to the men already in practice. Incidentally other rights must be



EDITORIAL

guarded. Consider the laws of New York State, for example. This State has granted charters to several colleges permitting them to teach dentistry. But of course the schools chartered in New York State must comply with the educational standards of admission which have been erected. Before a graduate of one of these schools can obtain a license to practice in New York State, he must pass the New York Board and thus prove that he can meet the dental standards demanded by New York laws. Let us for a moment have in mind a young New Yorker desirous of practicing in his own city. Seeking an education, he discovers that there are schools outside of New York which have lower entrance requirements, and situated perhaps in States having lower standards of dental examination. Now presuming that such a man could leave his own State and obtain education and dental license more easily elsewhere, and supposing that having such license he could interchange with New York and thus gain his end, and practice in his home city, would it not be likely that he would adopt this easier road, and would not New York State, in granting that interchange license, be discriminating against the schools which New York State has chartered? This question needs no reply. The deduction is obvious. To protect her own people, and her own schools, New York must not grant license except to candidates who can measure up to the New York standards. In other words, though a dentist may be "good enough" for the examining board of some other State, he should not be considered good enough for New York unless he could measure up according to the New York measurement of a dentist. What is true of New York is equally true of all States, but has more force in those States wherein there are dental schools.

The logical deduction of this argument is that there can be no unrestricted granting of license interchange until all States have equal standards and equally capable examining boards. So long as the doctrine of States right shall be maintained in this country, just so long will it be next to impossible to enact exactly similar laws throughout the Union.



**Interchange
Possible.**

Does it follow that the problem of interchange is unsolvable? Not at all. Indeed, it was very well solved at Asheville, and the proposition there enunciated would have proven many times more successful if the National Association of Dental Examiners had shown themselves as enthusiastic for interchange when at home acting as bodies with legal power, as they seemed to be when in convention at Asheville, where their legal powers are less than zero.

The so-called Asheville resolution was especially drawn to meet the difficulties of the problem of protecting both communities and chartered schools. The most potent restriction is that the candidate shall have been in practice five years, and that he shall not only have his original State Board license, but likewise a recommendation from his State Board.

The schools are thus protected because, to come back to our superstitious case, our New York man, wishing to practice in his own city, would not go out of the State for his education and license, if compelled to practice in that foreign State for five years before being able to obtain an interchange license in New York.

Secondly, the differing standards are somewhat equalized by the fact that the candidate must have first obtained a license, then have practiced continuously for five years, and at that time must be able to obtain a recommendation from the Board of the State which he leaves. Compliance with these requisites make a common measurement of a dentist which might very well be acceptable to all States.

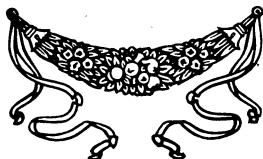
**Abuse of
Interchange.**

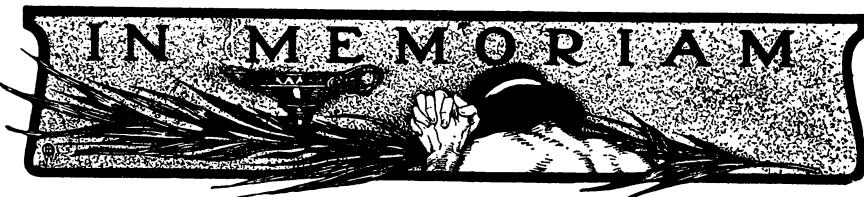
But as just as is the Asheville resolution, many have sought its aid to accomplish exactly that which the resolution was so carefully drawn to prevent. They have hoped to enter one State by way of another. Thus a man desiring to move from Wisconsin to New York, and hearing that New Jersey interchanged with both, elected to obtain a license from New Jersey by interchange from Wisconsin, and upon that to demand a license from New York also by interchange. This would be manifestly unjust, since New Jersey would thus merely become a means of passing a man from Wisconsin to New York who could not enter New York direct. But such attempts could be easily



frustrated by the requirements of the Asheville resolution, even in its original wording. The Wisconsin man having obtained an interchange license from New Jersey, when applying for an interchange into New York, should be asked, "Where is your recommendation from the New Jersey Board showing that you have been in practice in that State for five years?"

Really the Asheville Resolution is a good solution which renders injustice to no one. It is restricted, of course, but restrictions will be necessary until standards are equalized in all States. That the Asheville Resolution has not been more widely adopted would seem to indicate that after all there is no widespread eagerness for interchange. The vast majority of dentists practice in one locality for a lifetime. Hence there is no great force back of the movement for interchange. Nearly all admit that interchange is desirable, of course, but being satisfied in their own localities they make no energetic effort to compass the result.





J. Bond Littig, D.D.S.

On May 25th New York dentists were startled to learn of the sudden death of Dr. J. Bond Littig. The Doctor, though sixty-seven years of age, appeared to be still in his prime and enjoying rugged health. He was ever present at the meetings of the more prominent local societies, and took active part in all discussions. Even his nearest friends did not suspect that he suffered from any heart ailment, so that the unexpected news of his death from heart failure was a great shock.

Those who had the honor of any close association with Dr. Littig will ever cherish memories of that intercourse as vital periods of their professional lives. He was a genial, wholesouled, thoroughly just and square dealing man, above the petty strifes that so often mar professional lives, yet ever ready to enter strife as a pacifier. In discussions his talk was always enlightening. Free from verbosity, but virile with the results of ripe experience, whatever he had to say was sure to attract attentive listeners, to their profit. He was also a good after dinner speaker, and during the past winter delivered at least two such addresses which astonished those present because of their exceptionally fine sentiments and the magnetic oratory of their delivery.

Dr. J. Bond Littig was born in Baltimore County, Md., May 4, 1840. He graduated from the Baltimore Dental College in 1861 and practiced dentistry in New York City continuously from 1862 till he died. He married Marion G. Downer at Dorchester, Mass., in 1871. He is survived by his widow and three daughters, Harriet B., Mary L., and Marion D., now Mrs. Wm. M. Tuttle.

At the time of his death Dr. Littig had been Professor of Prosthetic Dentistry for about thirty-six years in the New York College of Dentistry. His long experience as a teacher, coupled with the fact that he had kept pace with the advance of modern methods of pedagogics, gave him such a value as a teacher that his loss to the College must be keenly felt.



John I. Hart, D.D.S.

The sudden and wholly unexpected death of Dr. John I. Hart caused one of the greatest shocks which the dental profession of the metropolitan district has suffered in many years. For twenty-four hours after his demise, the telephones between New York, Brooklyn and New Jersey cities were in constant use, transmitting the sad news, a fact which attests to his great popularity among his confreres.

Dr. Hart had been enjoying good health, except for a slight intestinal disturbance a few days before his death, from which, however, he had fully recovered. He had attended a dental meeting in Massachusetts and had only just returned home, when on Sunday he arose to find the day so fine that he elected to spend the morning enjoying a ride in the Park. He returned and dined with his family, and then went into his office to write a few letters. These he himself took out to post, and coming back told his wife that he had a little matter to care for in his office, and again repaired thither. Later the sound of a falling body reached Miss Hart's ears, and she went down and was horrified to discover Dr. Hart lying face downward on the floor. A physician was hastily summoned, but he died a few minutes later, of heart failure. The Doctor literally died at his work, for when discovered he had a small plaster cast in one hand and a carving instrument in the other.

Mrs. Hart has presented to the College his entire professional equipment, and his operating room has been photographed, so that as nearly as possible it may be reproduced, though in a larger room, in the new college building, where it will be known as the John I. Hart Clinic Room, and will be reserved for special demonstrations.

Dr. John I. Hart was the son of Harriet and Benjamin I. Hart, and was born August 7, 1865, in New York City. He graduated from Columbia Grammar School, in the class of 1881. He also attended school in London, England. Became a dental student under Dr. M. L. Chain, and later entered the New York College of Dentistry, from which he was graduated in 1887. He was the youngest in his class, yet took the highest honors, receiving the gold medal. He at once started independent practice.

He became a member of the more important local societies, and also joined the State and National bodies. He was president for two terms of the First District Society; president for two terms of the Odontological Society; treasurer of the Dental Society of the State of New York for several years; vice-president and then president for two years. He was vice-president of the National Dental Association for



one term, and at the time of his death was President of the National Association of Dental Faculties. He was also a member of the Federation Dentaire International, also a member of the Interstate Dental Fraternity, of which he was vice-president for New York, and likewise a much beloved member in Delta Sigma Delta, all members of which brotherhood will mourn his loss.

Somewhere behind the veil which obscures the future, we must meet again, Brother Hart, for such love as you inspired must be immortal.

DELTA SIGMA DELTA.

Dr. L. L. Lessler.

Resolved, That in his death this Association has lost an efficient member and an esteemed worker for the promotion of dental standards and education.

Resolved, That we extend to his family our sincere sympathy and assure them of our admiration for his high personal and professional qualities.

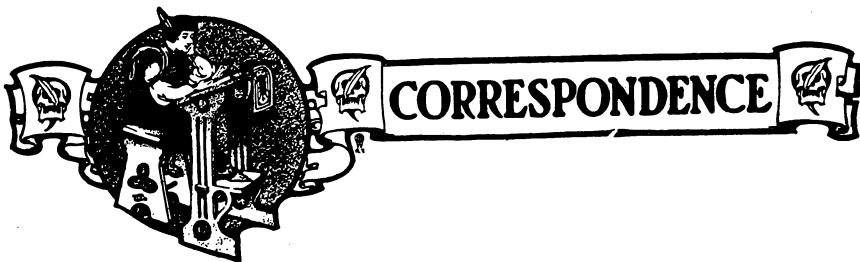
Resolved, That these resolutions be spread on the records of the Association and a copy sent to the family of our departed member, and copies forwarded to the dental journals for publication.

G. C. MARLOW, President.

C. W. COLLOVER, Secretary.

Southern Wisconsin Dental Association.

Lancaster, Wis.



Formula for an Investment.

Chicago, Ill., June 14, 1907.

ITEMS OF INTEREST,

New York, N. Y.

Dears Sirs:

The following formula for compounding an investment plaster for every department of the dental laboratory will be found to fill every practical requirement:

Good ordinary dental plaster, by measure.....2 parts.

Pulverized mica (mica flour), by measure.....1 part.

Marble dust (pulverized fine), by measure.....1 part.

Mix carefully and thoroughly to insure a uniformity of the mass.

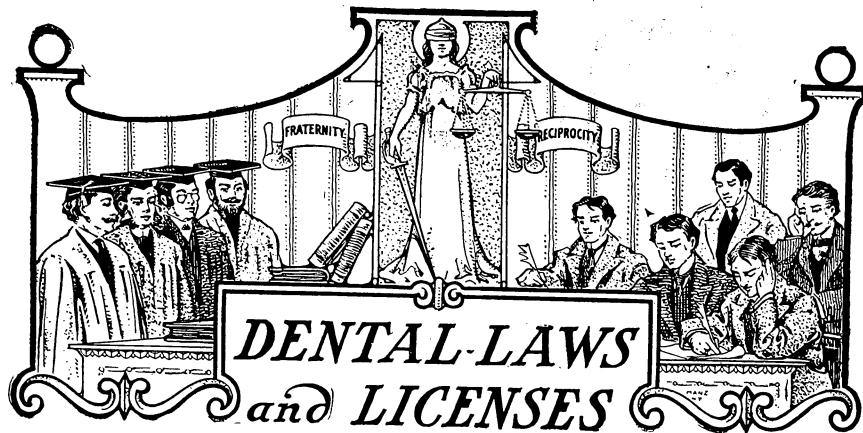
Mica flour (pulverized mica) may be obtained from the United States Mica Mining and Milling Company, of Micanite, Colorado.

This formula is the result of my own experiments. I have been using it exclusively in my own laboratory over a year.

Yours very truly.

H. S. CROSS, D.D.S.





Requirements for Licenses and Dates of Examinations.

Secretaries of State Boards are requested to keep us constantly posted in regard to dates and places of examinations or changes in their laws that this department may be kept up to date.

Examination required, with or without diploma.

Alabama. Examination fee \$10. No special examination granted to practitioners already in practice. No interchange of license with any States. Examinations annually on the Monday before the second Tuesday in May of each year. Secretary, Dr. Thomas P. Whitby, Selma, Ala.

Arizona. Examination fee \$25. Secretary, Dr. W. P. Sims, Brisbee, Ariz.

Arkansas. Examination with or without diploma; applicants must attain an average of 75 per cent. to pass. Examination fee \$5. No special examination granted to practitioners already in practice; no temporary licenses. Oklahoma reports interchange with Arkansas, but the secretary of Arkansas reports no interchange as yet. Secretary, A. T. McMillan, Fifth and Main Streets, Little Rock, Ark.

Examination required with or without diploma.

California. Examination fee \$25. No special examination granted to practitioners already in practice. No interchange of license with any States. In the even years the summer examination will be held in San Francisco, beginning the second Monday in June, followed



ITEMS OF INTEREST

by an examination in Los Angeles the third Monday in June. In the odd years the summer examination will be held in Los Angeles beginning the second Monday in June, followed by one in San Francisco beginning the third Monday in June. The winter examination will be held in San Francisco beginning on the second Thursday of December of each year. Secretary, C. A. Herrick, Jackson, Amador County, Cal.

Examination granted to holders of diploma

Colorado. only. Examination fee \$10. No special examination

granted to practitioners already in practice. No interchange of license with any States. Examinations first Tuesday of June and December, at Denver. Secretary, Dr. M. S. Fraser, 407 Mack Building, Denver, Colo.

Applicant for examination must have diploma,

Connecticut. or must have had five years' instruction from a licensed dentist, or three years' practice as a legally

qualified dentist. Examination fee \$25. A special clause permits reciprocal interchange of licenses in accordance with the Asheville resolution. Recorder, G. M. Gilbert, 783 Main Street, Hartford, Conn.

Examination and diploma required in all cases.

Delaware. Examination fee \$10; \$1 for certificate. All applicants

for certificates come under the same conditions. No interchange of license with any other States. Examinations first Wednesday in January, April, July, and October. Place of meeting given when applicant writes for the information. Secretary, C. R. Jef-feris, New Century Building, Wilmington, Del.

Examination with or without diploma. Exam-

District of Columbia. ination fee \$10. Reciprocal interchange of license with the State of New Jersey in accordance with the provisions of the Asheville resolution. Secretary,

Dr. S. G. Davis, 607 13th Street, Washington, D. C.

Examination required with diploma. Examina-

Florida. tion fee \$10. No special examination for practitioners already in practice. Secretary, W. G. Mason, Tampa, Fla.

Examination required with or without diploma.

Idaho. Examination fee \$25. No special examination granted to practitioners already in practice. No interchange of license with any State. Secretary, C. E. M. Loux, Pocatello, Idaho.

Examination required with or without a diploma.

Illinois. Examination fee \$20. License fee \$5. No special examination required for practitioners already in practice. No interchange of licenses with any other State. Examinations



ITEMS OF INTEREST

twice each year, usually in May and October. Secretary, Dr. J. G. Reid, 67 Wabash Avenue, Chicago, Ill.

Indiana. Applicants for examination must possess diploma from recognized college or must have had five years' dental practice under a reputable practitioner of this State. Examination fee \$20. No special examination granted to practitioners already in practice. Reciprocal interchange of license with the State of New Jersey in accordance with the provisions of the Asheville resolution. Secretary, Dr. F. R. Henshaw, Middletown, Ind.

Iowa. Examination required with diploma. Examination fee \$20. No special examination granted to practitioners already in practice. No interchange of license with any States. Secretary, Dr. E. D. Brower, Le Mars, Ia.

Kansas. No examination required if applicant has a diploma from a reputable college; otherwise examination required. Examination fee \$10. No special examination granted to practitioners already in practice. No interchange of license with any States. Secretary, Dr. M. I. Hults, Hutchinson, Kan.

Kentucky. Examination required with diploma. Examination fee \$20. No special examination granted to practitioners already in practice. No interchange of license with any States. Examinations first Tuesday in June and December in Louisville. Secretary, Dr. C. R. Shacklette, 628 Fourth Avenue, Louisville, Ky.

Louisiana. Examination required with diploma. Examination fee \$25, payable in advance. No special examination granted to practitioners already in practice. No interchange of license with any States—Board has the matter under consideration. Examinations twice annually in New Orleans, first examination on the day following the commencement exercises of the New Orleans College of Dentistry. Second examination occurs on the first Tuesday after the third Monday in October. Secretary, treasurer, and attorney, L. A. Hubert, 137 Corondelet Street, New Orleans, La.

Maine. Examination required with or without diploma. Examination fee \$20. No special examination granted to practitioners already in practice. No interchange of license with any States. Secretary, Dr. Dana W. Fellows, Portland, Me.

Maryland. Examination required with diploma. Examination fee \$10. No special examination granted to practitioners already in practice. No interchange of



license with any State. Examinations occur twice annually in Baltimore. Secretary, F. F. Drew, 701 N. Howard Street, Baltimore, Md.

Examination required with or without diploma.

Massachusetts. Examination fee \$20 for first examination, subsequent examinations \$5. No special examination granted to practitioners already in practice. No interchange of license with any States. Hereafter candidates for second and subsequent examinations will be required to fill out an application blank and forward it to the secretary. Every candidate for examination must be twenty-one years of age. Application blanks may be obtained from the secretary. Temporary licenses are never granted. The fee for third and subsequent examination is \$5.00. Secretary, Dr. G. E. Mitchell, Haverhill, Mass.

Examination required with or without diploma.

Michigan. Examination fee \$10. Practitioners already in practice may have a special examination before any member of the Board which will enable him to practice until the next regular meeting of the Board, when a regular examination must be taken. Reciprocal interchange of license with New Jersey in accordance with the provisions of the Asheville resolution. Secretary, Dr. E. A. Honey, Kalamazoo, Mich.

Minnesota. Diploma must be presented from a dental college in good standing or satisfactory evidence must be given of having been engaged in the practice of dentistry as early as April, 1879. Examination fee \$10. No special examination granted to practitioners already in practice, and the Board has no power to grant temporary license of any kind. No interchange of license with any States. Examinations first Tuesday in April and October. Held at Dental Department of the State University at Minneapolis. Secretary, C. H. Robinson, Wabash, Minn.

Examination required with or without diploma.

Mississippi. Examination fee \$10. Practitioners already in practice will be granted an examination by any member of the Board, who is authorized to issue a temporary license which will be valid until the next succeeding meeting of the Board. Only one temporary license shall ever be issued to the same applicant. Examinations third Tuesday in May of each year. Secretary, Dr. P. P. Walker, Brandon, Miss.

Examination with diploma or certificate. Examination fee \$10. No special examination granted

Missouri. practitioners already in practice. There is an annual license fee of \$1.00, which, if not paid, registration becomes forfeited.



No interchange of license with any States. Secretary, S. C. A. Rubey, Clinton, Mo.

Montana. Examination with or without diploma. Examination fee \$25. No special examination granted to practitioners already in practice. No interchange of license with any States. Secretary, D. J. Wait, Helena, Mont.

Nebraska. Examination required with or without diploma. Examination fee \$25, except to Nebraska graduates fee is \$10. No special examination granted to practitioners already in practice. No interchange of license with any States. C. F. Ladd, Lincoln, Neb.

Nevada. Examination required of all graduates. Examination fee \$25. No special examination granted to practitioners already in practice. No interchange of license with any States. Secretary, C. A. Coffin, Reno, Nev.

New Hampshire. Examination required with or without diploma. Examination fee \$10. No special examination granted to practitioners already in practice except by agreement of the full Board. No interchange of license with any States. Secretary, A. J. Sawyer, Manchester, N. H.

New Jersey. Applicant must be a graduate of a reputable dental college in the United States and hold a high school diploma or a certificate from the State superintendent of public instruction, Professor Baxter, Trenton, N. J. No foreign diplomas accepted by the board. Examination fee, \$25. Reciprocal interchange of license with Utah, Tennessee, Iowa, Indiana, Michigan, Vermont, District of Columbia and New York, in accordance with the provisions of the Asheville resolution. Practical and theoretical examination of the board all completed in Trenton, N. J., at the State House. Two examinations each year, July and December. Secretary, Dr. Charles A. Meeker, 29 Fulton Street, Newark, N. J.

New Mexico. Examination required with or without diploma. Examination fee \$25. Fee for certificate \$5. All licensed dentists within the Territory shall on or before the first day of June of each year register with the secretary of the board, and shall pay therefor an annual fee of \$3. No special examination granted to practitioners already in practice. No interchange of license with any States. Secretary, C. N. Lord, Santa Fe, N. M.

New York. Diploma from a registered school is necessary for admission to the dental licensing examination. Applicants who have had six years' practice in dentistry may on unanimous recommendation of the Board receive a license



ITEMS OF INTEREST

to practice in this State provided they meet the necessary professional and preliminary requirements. Examination fee \$25. Reciprocal interchange of license with New Jersey and Pennsylvania. Chief, Charles F. Wheelock, Examinations Division, New York State Education Department, Albany, N. Y.

Examination with or without diploma. Examination fee \$10. No special examination granted to practitioners already in practice. Secretary, R. H. Jones, Winston-Salem, N. C.

Examination required with or without diploma. Examination fee \$10; additional fee for license, \$5. No special examination granted to practitioners already in practice. No interchange of license with any States. Examination, second Tuesday in July. Secretary, H. L. Starling, Fargo, N. D.

The Board will register without examination all graduates of the Ohio colleges who made proper application and paid the required fee of \$10 prior to the June, 1905, session of the Board; all other applicants must be graduates and pass examination before they can practice legally in Ohio. Examination fee \$20; registration fee \$10. There is an exemption clause which permits the Board to register a person who has been in practice in the State of Ohio continuously since January 1, 1903; this must be verified by evidence. Application should be filed with the secretary ten days prior to examination. Secretary, H. C. Brown, 185 East State Street, Columbus, Ohio.

Examination required with or without diploma. Examination fee \$25. No special examination granted to practitioners already in practice. Reciprocal interchange of license with Arkansas. Secretary, A. C. Hixon, Guthrie, Okla.

Examination required with diploma. Examination fee \$10. No special examination granted to practitioners already in practice. No interchange of license with any States. Examination in November, in Portland. Secretary, O. D. Ireland, 614 Dekum Building, Portland, Ore.

Examination required with diploma. Examination fee \$15. No special examination granted to practitioners already in practice. Reciprocal interchange of license with New York. Secretary, C. N. Schaeffer, Harrisburg, Pa.

Examination in all cases. Examination fee \$20. No special examination granted to practitioners already in practice. In regard to interchange the



Board has recommended an amendment to the law giving the board discretion. Secretary, W. S. Kenyon, 301 Westminster Street, Providence, R. I.

South Carolina. Examination with diploma. Examination fee \$15. No special examination granted to practitioners already in practice. No interchange of license with any States, but is not opposed to a satisfactory plan of exchange. Secretary, Dr. B. Rutledge, Florence, S. C.

South Dakota. Applicants for examination must have diploma or must have had three years' practice immediately preceding examination. Examination fee \$10; license fee \$5. No special examination granted to practitioners already in practice. No interchange of license with any State. Secretary, G. W. Collins, Vermillion, S. D.

Tennessee. Registers diploma without examination and examines all others. Examination fee \$5. No special examination granted to practitioners already in practice. Reciprocal interchange of license with New Jersey, in accordance with the provision of the Asheville resolution. Secretary, F. A. Shotwell, Rogersville, Tenn.

Texas. Examination required in all cases. Examination fee \$25. Temporary licenses granted to holders of diplomas between meetings of the Board; good until the following meeting. Temporary licenses granted to others after an examination by any member of the Board. Good until the next meeting of the Board. Fee for temporary license \$2. Secretary, C. C. Weaver, Hillsboro, Texas.

Utah. Examination required with or without diploma. Examination fee \$25. No special examinations granted to practitioners already in practice. Reciprocal interchange of license with New Jersey in accordance with the provisions of the Asheville resolution. Examination not yet fixed. Usually April and October. Secretary, H. W. Davis, 511-513 McCormick Block, Salt Lake City, Utah.

Vermont. Examination required in all cases. Examination fee \$25. No special examination granted to practitioners already in practice. Board is empowered to make interchange of license, in accordance with the Asheville resolution. Interchanges with New Jersey. Secretary, G. F. Cheney, St. Johnsbury, Vt.



Examinations required with or without diploma.

Virginia. Examination fee \$10. No special examination granted to practitioners already in practice. No interchange of license with any State. Secretary, R. H. Walker, Norfolk, Va.

Examination required with diploma. Examination

Washington. fee \$25. No special examination granted to practitioners already in practice. No interchange of license with any States. Examinations in May and November. Secretary, C. S. Irwin, Vancouver, Wash.

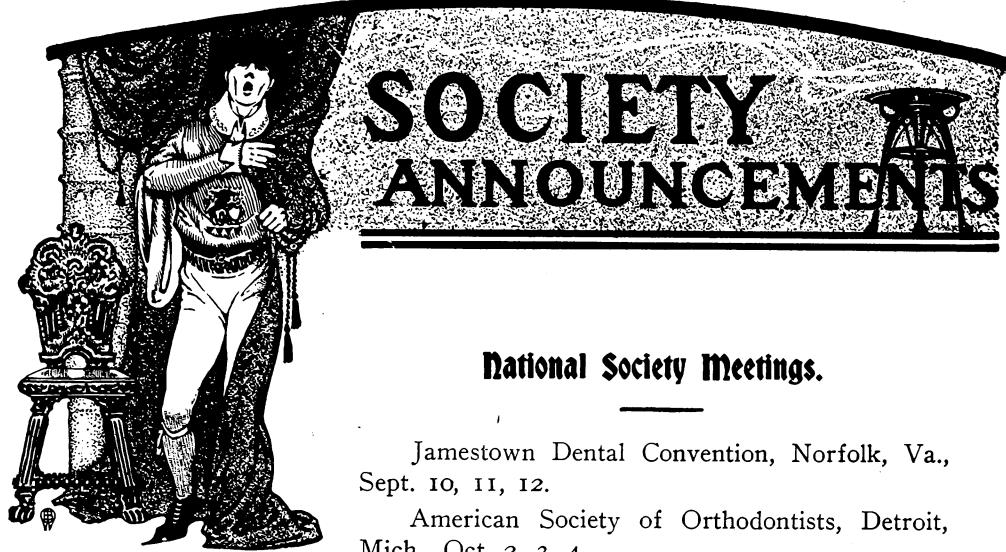
Examination required with or without diploma.

West Virginia. Examination fee \$10. No special examination granted to practitioners already in practice. No interchange of license with any State. Application blanks and all necessary information furnished by the secretary. Secretary, H. M. Van Voorhis, Morgantown, W. Va.

Examination required with diploma. Examination

Wisconsin. fee \$10. Dentists who have practised for four years or have been apprenticed to a reputable dentist for five years are entitled to examinations. No special examination granted to practitioners already in practice. No interchange of license with any State. Secretary, J. J. Wright, 1218 Welles Building, Milwaukee, Wis.





SOCIETY ANNOUNCEMENTS

National Society Meetings.

Jamestown Dental Convention, Norfolk, Va.,
Sept. 10, 11, 12.

American Society of Orthodontists, Detroit,
Mich., Oct. 2, 3, 4.

State Society Meetings.

Northeastern Dental Association, Portland, Me., Oct. 16, 17 and 18.
Virginia State Dental Association, Jamestown, Sept. 10, 11, 12.

Jamestown Dental Convention.

The essayists of the meeting are as follows: Professor W. D. Miller, of Berlin, Germany, subject, "Demonstrations of Preparation Relating to the Wasting (so-called erosion) of the Teeth;" Dr. Chas. L. Alexander, Charlotte, N. C., subject, "Gold Inlays;" illustrated paper by Dr. F. T. Van Woert, Brooklyn, subject, "Is the Cemented Filling the Filling of the Future?" Dr. R. Ottolengui, New York, subject, "The Purposes and Accomplishments of Modern Orthodontia."



Transportation Rates to the Jamestown Dental Convention.

The following rates to the Exposition have been made by the transportation lines: Season tickets, 80 per cent. of double one way; sixty-day ticket, one and one-third fare, plus 25 cents; ten-day ticket, one and one-third fare, plus \$2.25. These rates will probably be lessened, or if not, there are likely to be special excursions from all parts of the country and Canada at low rates.

The following places of interest can be visited as side trips: Jamestown Island, \$1.00; Yorktown, \$1.00; Williamsburg, \$1.95; Washington, \$3.50; Baltimore, \$5.00; New York, Old Dominion Steamship Co., \$13.00 round trip; Philadelphia, rail, \$9.00 round trip; Richmond, \$3.50 round trip.

H. W. CAMPBELL, Secretary.

Northeastern Dental Association.

The thirteenth annual meeting of the Northeastern Dental Association will be held in the city of Portland, Maine, Hotel Lafayette, on October 16, 17 and 18, 1907. Preparations are being made for a valuable and instructive meeting.

EDGAR O. KINSMAN, D.M.D.,
Cambridge, Mass.

Secretary.

Union of Three State Societies.

State dental associations of Washington, Oregon and California will be consolidated at the annual meeting to take place in Spokane, Wash. Former President Cutler, of the Washington Association, has been appointed a committee of one to arrange for the unification, the plan of which is to endeavor to promote uniform dental laws and thus make certificates interchangeable between the three States. These officers were elected at the session at Seattle: President, Dr. R. A. Monroe, Spokane; secretary, A. S. Oliver, Spokane; first vice-president, Dr. J. K. Appleby, Everett; second vice-president, Dr. Lizzie C. Stuart, Seattle; treasurer, Dr. S. L. Monk, Montesano.

There are three vacancies in the Board of Dental Examiners, and among the candidates proposed to fill the vacancies are Dr. J. W. Dunning and Dr. R. E. Shanks, of Spokane.

AUGUST WOLF.



ITEMS OF INTEREST

Illinois State Dental Society.

The Illinois State Dental Society held its forty-third annual meeting at Quincy, May 14 to 17, 1907. The following officers were elected for the ensuing year: President, W. A. Johnston, Peoria, Ill.; vice-president, Henry L. Whipple, Quincy, Ill.; secretary, Arthur D. Black, Chicago, Ill.; treasurer, C. P. Pruyn, Chicago, Ill.; librarian, J. T. Cummins, Metropolis, Ill.

The 1908 meeting will be held at Springfield, May 12, 13, 14 and 15.
ARTHUR D. BLACK, Secretary.

31 Washington Street, Chicago, Ill.

National Association of Dental Salesmen.

The New York Branch of the National Association of Dental Salesmen held their first annual banquet at the Hotel St. Denis, Broadway and Eleventh Street, New York City, Thursday evening, June 6th. The guests and speakers of the evening were the heads of the several dental houses in and about New York, namely: Mr. C. A. C. Kelly, of Buffalo, N. Y.; Mr. W. Sykes, of Ash & Sons; Mr. A. H. Bultman, of Consolidated Dental Mfg. Co.; Mr. H. A. Curtis, of Consolidated Dental Mfg. Co.; Mr. Slaight, of Parkington & Slaight; Mr. Rossig, of Eckley Dental Supply Co.; Mr. Herman, of the Dentists' Supply Co.; Dr. Clapp, of the Dentists' Supply Co.; Dr. Frame, of the Columbus Dental Mfg. Co.; Messrs. Osmun & Cook, of Newark, N. J.

It was moved and seconded that Mr. Fred J. Starr was to be sent to represent the New York Branch at the National Association of Dental Salesmen's meeting to be held at Pittsburg in July. After a very harmonious and enjoyable evening, which everybody seemed to appreciate, the feast came to a close to be resumed at their next regular meeting in September.

